

# THE RELATIONSHIP BETWEEN THE EXISTANCE OF NITRATES IN DRINKING WATER SUPPLIES AND THE HEALTH OF THE POPULATION IN TIMIS COUNTY

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## REZUMAT

**Introducere.** Studiul a avut drept scop identificarea unor factori de risc din apa potabilă distribuită în județul Timiș, din diferite surse (instalațiile centrale de aprovizionare cu apă potabilă și sursele locale - foraje publice și private) și relaționarea cu starea de sănătate a populației. **Metodologie.** Baza de date privind concentrația nitraților în apa potabilă/sursă/localitate, de la Autoritatea de Sănătate Publică Timiș a fost prelucrată și reprezentată pe hartă (programul Quantum Gis 8 și Epi Info) și s-a stabilit legătura cu morbiditatea acută (methemoglobinemia acută) și cronică (cancerul digestiv, limfomul non-Hodgkin). **Rezultate și discuții.** S-a analizat apa potabilă distribuită la 52,3% localități din județul Timiș; 72,3% dintre localități au avut o apă cu concentrație a nitraților > 5 mg/l și 27,6% cu nitrați > 50 mg/l. Se observă o evoluție relativ constantă a incidenței cancerului digestive, cât și a limfomului non-Hodgkin. Incidența cancerului digestiv a fost mai mare - 50–60 cazuri la 100 000 locuitori, față de limfomul non-Hodgkin 2–6 cazuri la 100 000 locuitori. În perioada studiată, nu s-au raportat cazuri de methemoglobinemie acută în județul Timiș. Prin analiza de regresie liniară s-a obținut un coeficient de corelație  $r = 0,47$ , ceea ce semnifică o legătură slabă între cele două variabile - concentrația nitraților din apa potabilă peste > 50 mg/l (valoarea maximă admisă) și morbiditatea prin cancer digestiv, în localitățile județului Timiș, semnificativă statistic  $p = 0,04$ . **Concluzii.** Incidența cancerului digestiv este explicată în procent de 22% de variația valorilor medii ale concentrației nitraților în apa potabilă - coeficientul de determinare  $r^2 = 0,22$ . Concentrația nitraților în apa potabilă a fost mai crescută preponderent la apa provenită de la forajele private de mică adâncime (cu apă freatică), în localitățile cu intensă activitate agricolă și zootehnică – principalele surse de poluare a apei cu nitrați.

**Cuvinte cheie:** nitrați, apă potabilă, cancer digestiv, methemoglobinemie

## ABSTRACT

**Introduction.** The present study's objectives were to identify some of the risk factors existent in the drinking water distributed in Timis County, from different sources (central installations for drinking water supply and local sources – public and private wells) and to establish a relation to the population's state of health. **Material and method.** The data base regarding the nitrates concentration in drinking water/source/locality, provided by The Public Health Authority of Timis County was processed and represented on the map (Quantum Gis 8 program and EpiInfo program) and a connection was made to acute morbidity (acute methemoglobinemia) and chronic morbidity (digestive cancers, non – Hodgkin lymphoma). **Results and discussions.** Drinking water was analyzed in 52.3% of Timis County localities, 72.3% of these localities had a nitrates concentration in water > 5 mg/l and 27.6% of the localities had nitrates concentration in water > 50 mg/l. It is noticeable a relative constant incidence for both digestive cancers and non – Hodgkin lymphoma. The incidence of digestive cancers was higher – 50–60 cases in 100000 people, up against the incidence of non – Hodgkin lymphoma 2-6 cases in 100000 people. During the study, there were no acute methemoglobinemia cases reported in Timis County. Through linear regression, a correlation coefficient was obtained  $r = 0.47$ . This value is suggesting a weak connection between the two variables – the concentration of nitrates in drinking water over 50 mg/l (maximum contaminant level) and the morbidity through digestive cancers in Timis County's localities, statistic significant  $p = 0.04$ . **Conclusions.** The digestive cancers incidence is 22% explained by the medium values for nitrates in drinking water concentration variation – the determination coefficient  $r^2 = 0.22$ . The nitrates concentration in drinking water was higher especially in water from shallow private wells (the water table), in localities with intense agriculture and animal farms – the primary sources for nitrates water pollution.

**Keywords:** nitrates, drinking water, digestive cancers, methemoglobinemia

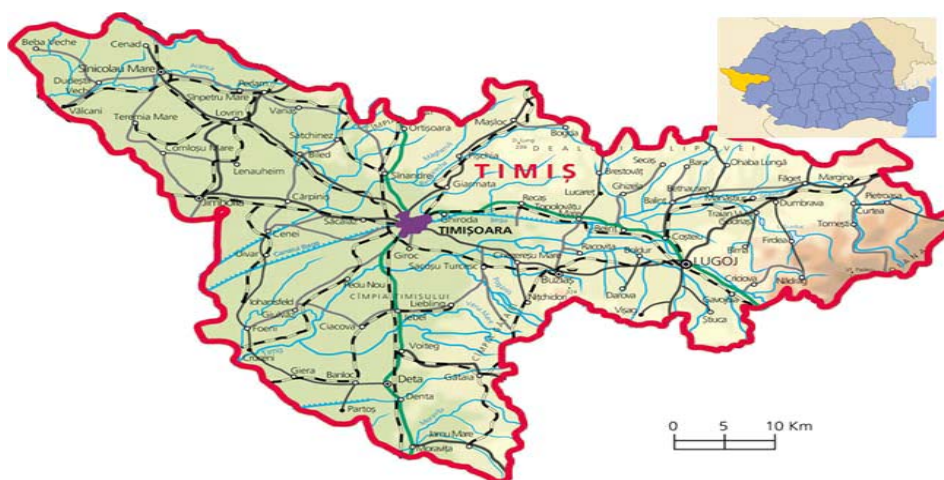
## INTRODUCTION

The present study's objectives were to identify some of the risk factors in the drinking water, both from rural and urban area in Timis County, originating in different sources (central installations for drinking water supply and local sources – public and private wells) and to establish a relation to the population's state of health.

The nitrates are inorganic compounds characterized by high water solubility. The major sources for the nitrates in the drinking water are the fertilizers used in agriculture and animal fertilizers provided by animal farms. Shallow wells are the most susceptible to nitrate contamination. Food is the major way of exposure to nitrates [1-4].

The nitrates represent a real danger for health because they are converted to nitrites. Once they are ingested, the conversion of nitrates into nitrites takes place in contact with saliva in all population groups and ages, and in the gastrointestinal tract of infants. High concentration of nitrates in drinking water can cause methemoglobinemia in infants, also called “blue babies” disease [4-6].

The high risk population categories for nitrites intoxication are: infants under 6 months of age, pregnant women after the 30th week of pregnancy, people with low gastric acidity, people presenting hereditary deficiencies of methemoglobin – reductase [1, 2].



**Figure 1. The Map of Timiș County**

After nitrates are converted to nitrites inside human body, they can react to certain substances containing amines present in foods, resulting nitrosamines, known to have potentially cancerous effects. The formation of nitrosamines is inhibited by antioxidants present in foods, for example vitamin C and vitamin E [7-10].

Endogenous formation of nitro derivatives was demonstrated in humans in connection to consuming water with levels of nitrates exceeding the maximum contaminant level (50 mg/l according to European Directive 98/83/EC, transpose in the Drinking Water Law 458/2002 and 10 mg/l according to United States Environmental Protection Agency) [11-16].

The WHO's recommendations are for the epidemiological studies to demonstrate the risk regarding exposure to medium levels of nitrates 5 – 10 mg/l and to clarify the role of nitrates in drinking water versus the role of nitrates from foods [12, 16].

## MATERIAL AND METHOD

In the 2003 – 2007 interval determinations were carried out for nitrates, nitrites, ammonia and oxidability in drinking water

from the consumer, derived from both the centralized distribution system and from private and public wells in urban and rural area – Timiș County.

The data base provided by the Public Health Authority of Timiș County was introduced in Excel and processed, resulting medium and maximum values for each sample gathering point and for each locality/year, and for water sources: centralized distribution system, public and private wells. Next an average was obtained for annual means for the studied period, and this was represented on maps (program Quantum Gis 8 and EpiInfo). The value determined for nitrates/locality/water source was represented on the map proportional to the dimension of the symbol and relative to MCL (maximum contaminant level). The data base was statistically processed, and the data analysis was done through summary statistical measures and advanced statistical tests.

According to WHO's recommendations the aim of this study was to highlight water sources with nitrates concentration exceeding the maximum contaminant level and the water sources with concentrations in the 5 -50 mg/l interval, for the final goal: to

mark out the relation between consuming water with nitrates and formation of nitro derivates.

Morbidity data, both acute (number of new cases of disease) and chronic (gastro intestinal and esophageal cancers, non – Hodgkin lymphoma) were received from the Public Health Authority Timis County – Medical Statistic Department, and were related, in a linear regression model, to exposure to nitrates and reported pathology.

In tables and graphics there were represented:

- the number of localities with nitrate polluted drinking water and the maximum and medium values determined for water nitrates/ source/county/studied period
- the specific morbidity for cause indicator was calculated – the specific incidence index ( indicate the frequency of new cases of a certain disease in a territory and a time period) according to formula:
- specific morbidity for cause =  $X * 100000 / \text{number of people exposed to the risk factor (for each year – for the 2003 – 2007 period)}$

- number of new cases of disease – “X”
- the evolution of the nitrates concentration/locality and the evolution of the incidence for both acute and chronic diseases investigated, in the 2003 – 2007 period
- the relation between medium values obtained in the studied period for nitrates concentration/locality and the morbidity for disease causes index.

## RESULTS AND DISCUSSIONS

The presence of nitrates in drinking water reflects an old pollution (weeks or months ago).

Only old nitrates pollution sources were selected for the study, recent pollution indicators – organic substance and ammonia, and relative recent pollution indicators – nitrites, were situated in the limits contained by the law [17-19].

**Table 1. The frequency of localities in Timis County where drinking water was analyzed and the nitrates concentration/water source (MCL – 50 mg/l)**

No people/ County	Water source	No people investi gate	No locali ties with nitrates >CMA	No locali ties with nitra tes = 5-50 mg/l	Me dium values/ source	Maxi mum values/ source	Maxi mum value/ source <CMA	Maximum value/ source >CMA
325	Centralized system	50	8	42	43.96	120	45	120
	Public wells	19	6	13	52.01	120	50	120
	Private wells	101	33	68	49.08	165	50	165
	<b>Total</b>	<b>170</b> <b>(52,3%)</b>	<b>47</b> <b>(27,6%)</b>	<b>123</b> <b>(72,3%)</b>				

The frequency of localities in Timis County where drinking water was analyzed and the nitrates concentration/water source are displayed in Table 1.

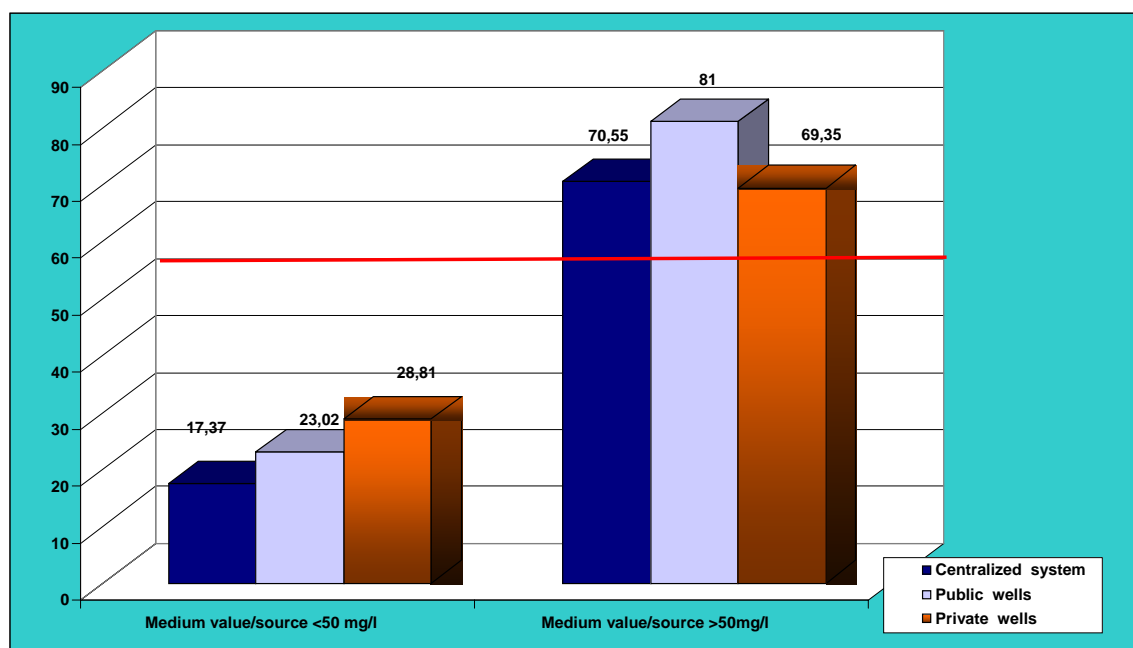
The highest medium value for nitrates concentration is found in private wells Figure 2, for sources where nitrates do not exceed MCL, and for sources where nitrates exceed MCL, the highest value was also found for private wells.

The evolution is relative constant for medium nitrates concentration in water from public and private wells in Timis County, in the 2003 – 2007 period and a decreasing

trend for water in the centralized distributing systems Figure 3.

Likewise the evolution of digestive cancers incidence and non – Hodgkin lymphoma incidence was relative constant. For digestive cancers the incidence is higher, with values between 50 – 60 cases in 100000 people, than for non – Hodgkin Lymphoma, 2 – 6 cases in 100000 people Figure 4.

There were no acute methemoglobinemia cases in Timis County for the studied period.



**Figure 2. Medium nitrates concentration (mg/l) for drinking water sources in Timis County, for the 2003 – 2007 period**

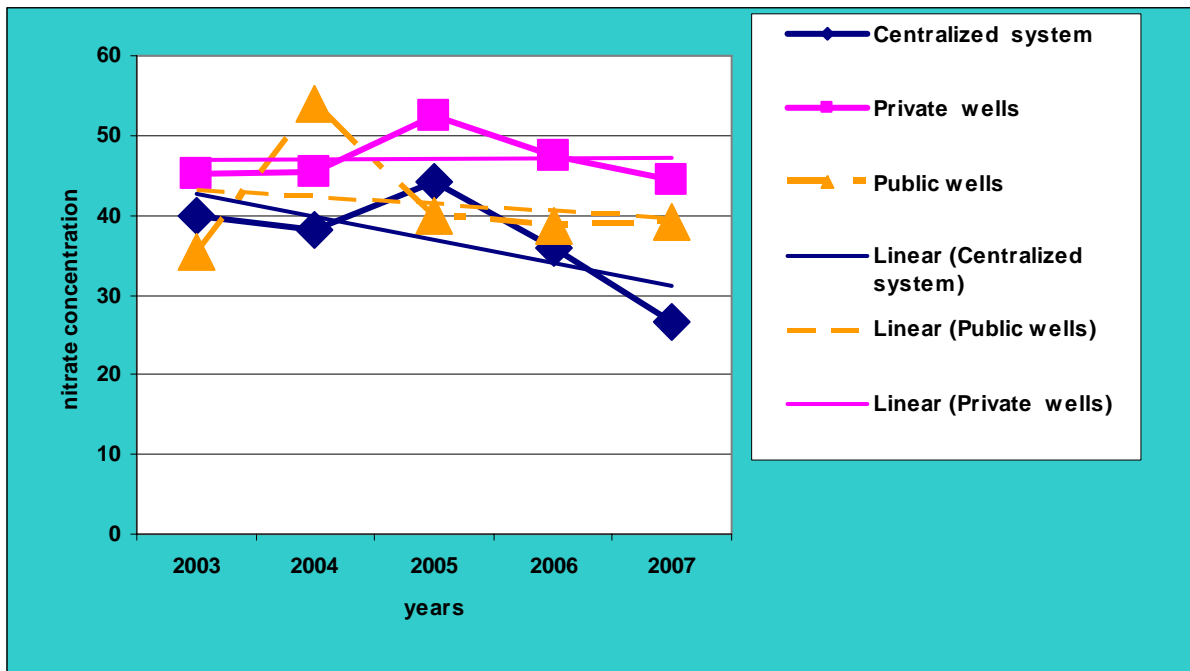


Figure 3. The evolution of medium nitrate concentration (mg/l) for drinking water sources in Timis County, for the 2003 – 2007 period

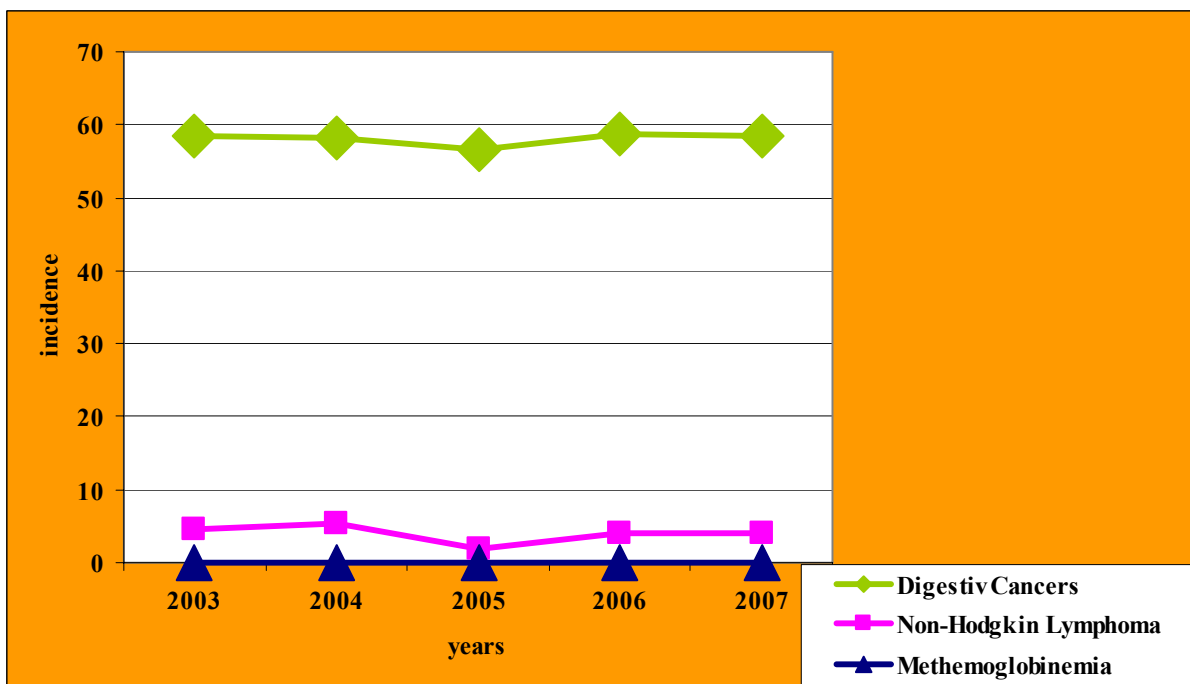
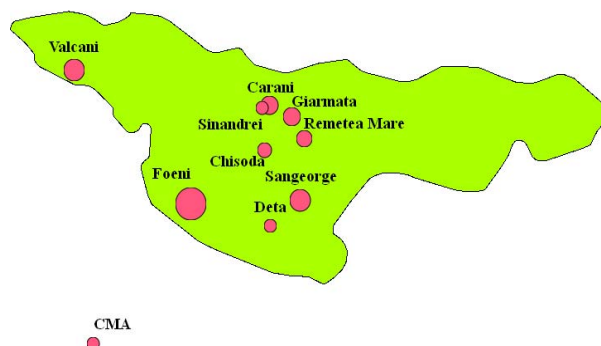
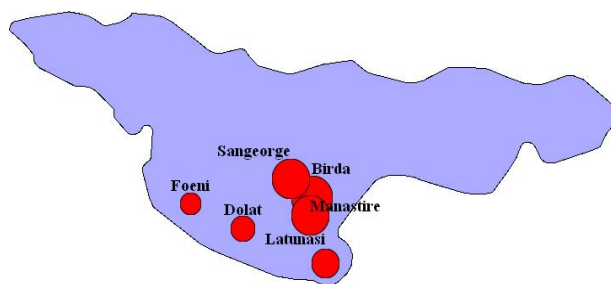


Figure 4. The evolution for acute and chronic diseases in Timis County, in the 2003 – 2007 period

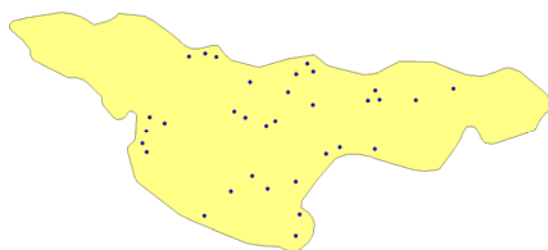
## Centralized system



## Public wells



## Private wells



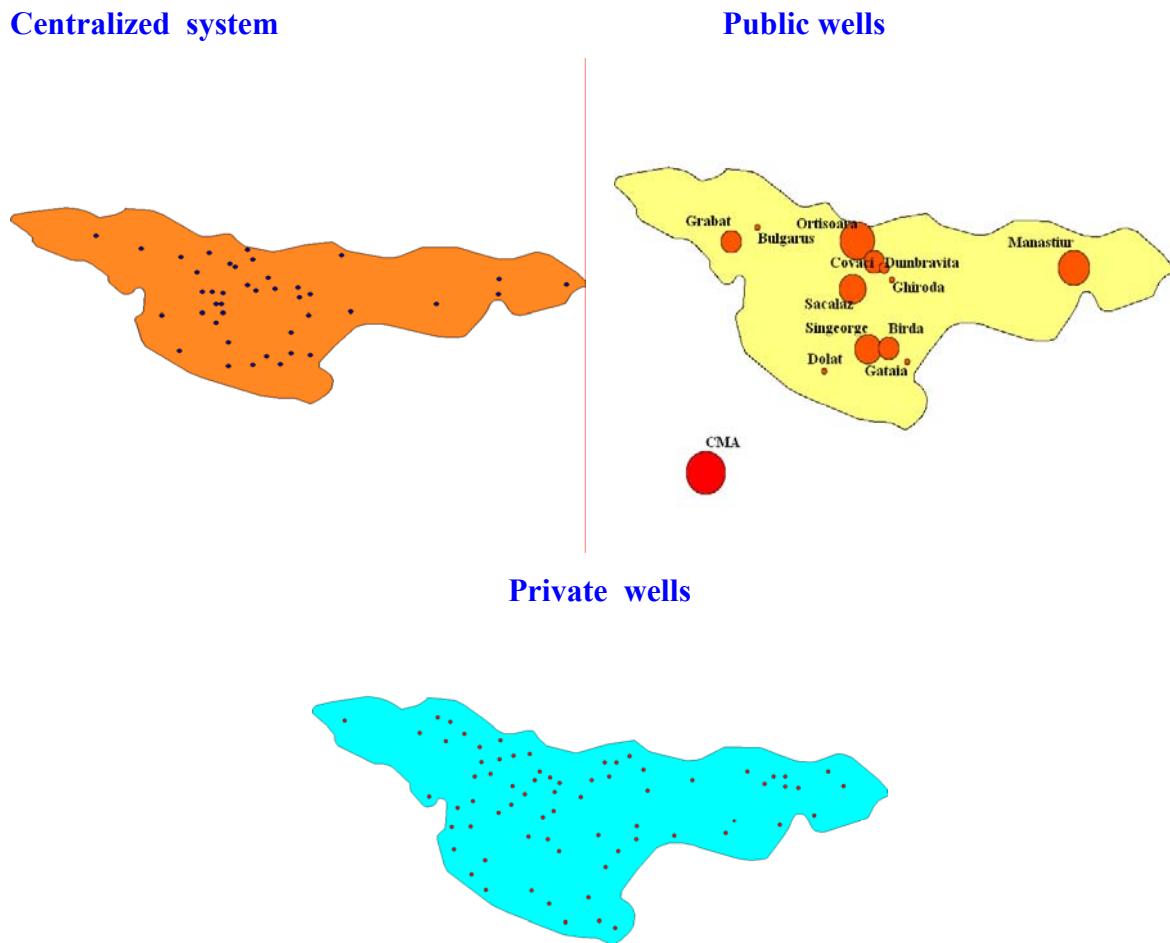
**Figure 5. Nitrates concentrations in drinking water (> 50 mg/l) from different sources, in localities of Timis County, during 2003 – 2007 period**

The localities in Timis County where drinking water with medium nitrates concentration exceeding MCL was distributed, during 2003 – 2007 period (Figure 5) were:

- centralized system – Carani 70 mg/l, Giarmata 70 mg/l, Chisoda 55 mg/l, Valcani 80 mg/l, Sangeorge 82.5 mg/l, Foieni 120 mg/l, Deta 59.4 mg/l;
- public wells – Manastire 95 mg/l, Sangeorge 95 mg/l, Dolat 70 mg/l,

Birta 98 mg/l, Foieni 70 mg/l, Latunas 70 mg/l;

- private wells – Manastire 60 mg/l, Sangeorge 61.5 mg/l, Deta 70 mg/l, Masloc 66.25 mg/l, Foieni 90 mg/l, Fibis 60 mg/l, Pischia 67.5 mg/l, , Giarmata 98.33 mg/l, Ghișoda 55 mg/l, Chizătău 120 mg/l, Lățunaș 77 mg/l, Otelec 66 mg/l, Sînmartinul Maghiar 70 mg/l.



**Figure 6. The nitrates concentration in drinking water (5 – 50 mg/l) from different sources, in localities from Timis County, during 2003 – 2007**

In the 2003 - 2007 period, the localities in Timis County where drinking water with medium nitrate concentration from, 5 to 50 mg/l, was distributed (Figure 6) were:

- centralized distribution system - Izvin 35 mg/l, Beregsaul Mare 17.33 mg/l, Sacosul Turcesc 19.5 mg/l, Dumbravita 29 mg/l, Lovrin 45 mg/l, Recas 9.7 mg/l, Banloc 45 mg/l, Buzias 17.5 mg/l, Chisoda 40mg/l, Birta 35mg/l, Bucovat 40mg/l;
- public wells - Masloc 26 mg/l, Rachita 26 mg/l, Ortisoara, 45mg/l, Sangeorge, 35mg/l, Manastur 40mg/l, Grabat 13.65mg/l, Dumbravita 13mg/l;
- private wells - Manastire 20.65 mg/l, Sangeorge 35 mg/l, Sacalaz 35 mg/l, Dumbravita 13 mg/l, Ortisoara 45 mg/l, Covaci 26mg/l, Birta 16,4mg/l, Gabat 20 mg/l

From regression analysis resulted a correlation coefficient  $r = 0.47$ , this suggesting a weak connection among the two variables – nitrates concentration in drinking water exceeding MCL and morbidity through digestive cancer, in localities from Timis County, statistical significant  $p = 0.04$ . The determination coefficient was  $r^2 = 0.22$ , and so the incidence of digestive cancer is explained in



percent of 22% by the variation of medium values of nitrates concentration in drinking

water (Figure 7).

**Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.470 <sup>a</sup>	.221	.175	19.84019

a. Predictors: (Constant), Timisconc50

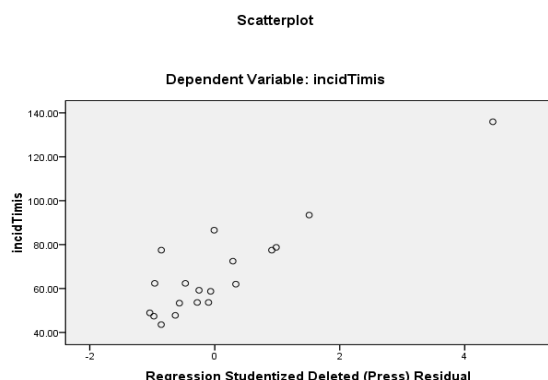
b. Dependent Variable: incidTimis

**ANOVA<sup>b</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1901.703	1	1901.703	4.831	.042 <sup>a</sup>
	Residual	6691.762	17	393.633		
	Total	8593.465	18			

a. Predictors: (Constant), Timisconc50

b. Dependent Variable: incidTimis



From regression analysis resulted a correlation coefficient  $r = 0.47$ , this suggesting a weak connection among the two variables – nitrates concentration in drinking water exceeding MCL and morbidity through digestive cancer, in localities from Timis County, statistical significant  $p = 0.04$ . The determination coefficient was  $r^2 = 0.22$ , and so the incidence of digestive cancer is explained in percent of 22% by the variation of medium values of nitrates concentration in drinking water (Figure 7).

**Figure 7. Linear regression model – Timis County/ localities – the digestive cancer variation related to the nitrates concentration from drinking water, exceeding MCL**

In the localities where the nitrates concentration in drinking water was higher, the incidence (new cases for 100000 people) for digestive cancers was also higher Figure 8, 9: Cenei 120.3, Giarmata 135.9, Foeni 86.56, Denta 94.01, Mosnita Noua 86.04, Masloc 93.46, Dumbravita 86.56, Birda 62.34, Manastire 77.47, Deta 59.21, Sangeorge 62.34.

amine containing substances, which are necessary for nitrosamines formation inside the human body. According to the new reference criteria of the United States Environmental Protection Agency (U.S.EPA) it is more appropriate to include nitrates and nitrites in the category of “inadequate information for assessing the carcinogenic potential” [12, 16].

There are no valid proofs that nitrates and nitrites may cause cancer in the absence of

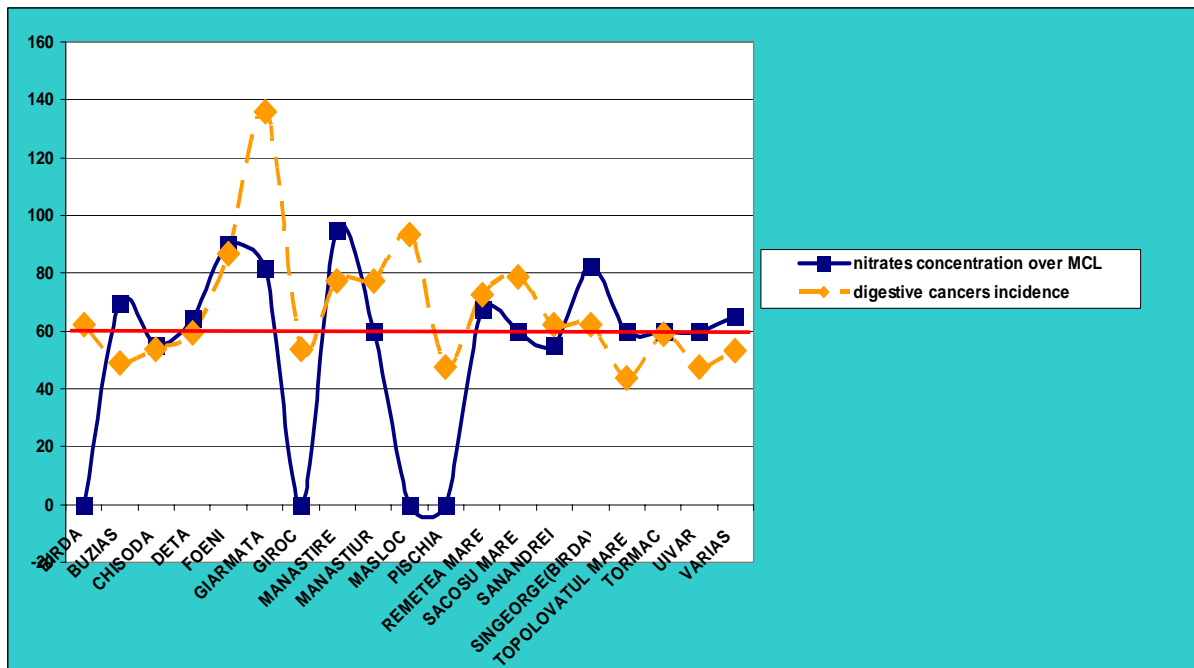


Figure 8. The digestive cancer variation related to the nitrates concentration in drinking water (> 50 mg/l)

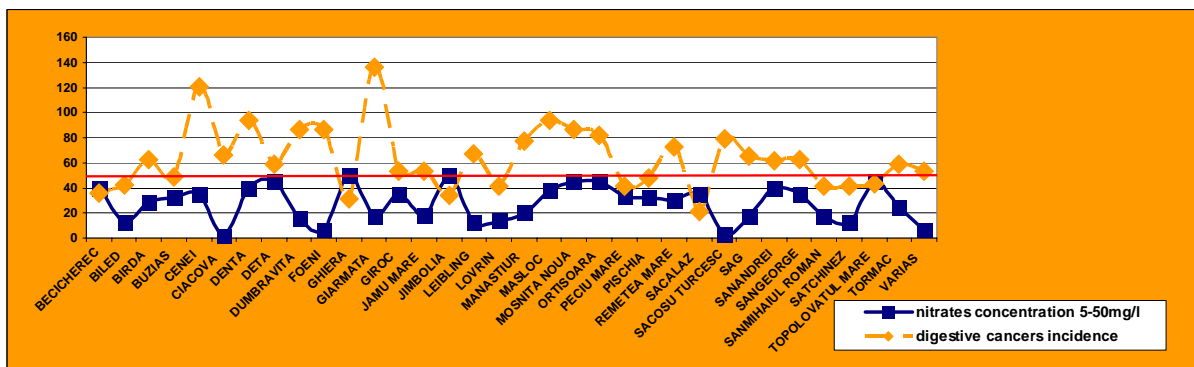


Figure 9. The digestive cancer variation related to the nitrates concentration in drinking water (5 – 50 mg/l)

The member states present to the European Committee periodical official reports, with a maximum interval of time of 4 years, concerning the water quality, areas vulnerable to nitrates and agricultural contamination, and the results of applying the Nitrates Directive (91/676/EEC). According to reports from the 1992 – 2005 time period, the highest nitrates concentration in drinking water is found in the West – European countries (25/30 mg/l) and the lowest is in the North – European countries (under 5 mg/l) [20, 21].

## CONCLUSIONS

The differences existing between the medium nitrates concentrations / locality may be explained as it follows:

- the type of water supply and different depths where water is extracted: the highest values were found in the case of private wells, all

around Timis County (the source is represented by the water table)

- the use of fertilizers in agriculture and the layout of individual drainage systems; in the Timis County there is a intensive agricultural and animal breeding activity (Beregsau, Cenei, Birda, Giarmata) representing the most important water pollution sources for nitrates.

Morbidity data obtained from the County Medical Statistics Department were incomplete for some of the localities or absent for others, due to deficiencies in reporting from the local medical practices.

Taking into account the long latency period for this type of pathology (the gastro – intestinal cancers and non – Hodgkin lymphoma – 15-20 years) it is considered as necessary the completion of a data base and the follow up of this morbidity indicators in the future [22, 8].

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The responsible institutions must realize the water supply management: the control of soil exploitation, the application of the law, correct measures regarding the buildings in the water supplying branch, the supervising and the maintaining of water quality according to the present legislation, educating the population.

According to WHO recommendations, future epidemiological studies have to:

- to clarify the role of water nitrates and food nitrates
- take into account the population that uses water from private wells, due to the fact that the concentration of nitrates is higher here than in the public water supply system
- trace the exposure to nitrates by determining them in saliva, blood, urine – biomarkers [16].

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# THE SOCIO-MEDICAL PERSPECTIVE OF SNORING. THE ORIENTATION IN THE MANAGING OF SNORING. THE USE OF ORAL DEVICES

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## REZUMAT

*Recent recunoscute ca o problemă, tulburările de somn corelate cu respirația, de cauză obstructivă, au un simptom comun: sforăitul. Dimensiunile socio-medicele ale sforăitului, precum și informații despre alternative de intervenție medicală sunt cuprinse în acest articol, care sintetizează date preluate din studiile clinice publicate pe această temă. Concluziile se axează pe sugerarea de soluții de remediere a subdiagnosticării și de măsuri de reducere a impactului tulburărilor de somn corelate cu respirația asupra accidentelor de muncă și circulație. Consecințele ar fi benefice atât în sens medical: creșterea accesibilității la un consult medical de specialitate, diagnostic și tratament precoce, cât și în sens economic: reducerea semnificativă a cheltuielilor de asistență medicală pe termen lung.*

**Cuvinte cheie:** obezitate, sforăit, dispozitive orale

## ABSTRACT

*Recently recognized as a problem, the obstructive sleep disturbances correlated with breathing have a common symptom: snoring. The socio-medical perspective and information about the alternatives of medical interventions are reunited in this review of several studies with the same research theme. The suggestion of solution to the problem of subdiagnostic of this pathology and measures of reduction of the impact of sleep disturbances correlated with breathing on work and traffic accidents are the main priorities for this review. The consequences are related to medical implications: the augmentation of accessibility to medical consult, and early diagnostic and treatment; and economic implication: the reduction of the medical costs on a long term perspective.*

**Keywords:** obesity, snoring, oral devices

## INTRODUCTION

Sleep represents a complex state, normal and physiological, transitory, completely reversible and rhythmical state, consisting of series of physiological, biochemical, psychological, and neuro-physiological processes. The quality and the quantity of the sleep are directly related to normal breathing that regulates the blood levels of oxygen and carbon dioxide, and respecting the measure of sleep hygiene. The sleeping disorder consecutive the ventilation modification has a distinctive symptom: snoring.

Snoring can be defined as a typical inhaling sound, although it has a small expiratory component, which appears during sleep due the vibration of the tissue of respiratory tract, having spectral characteristics and which can be heard, recorded and analyzed [1]. Snoring is always preceded by the restriction of respiratory flow [2]. The direct patient observation indicate that, the sound produced by snoring is specific to each patient and it is situated on different levels: uvula, soft palate, pharynx, tongue, epiglottis by the vibration of the soft palate and different grades of collapse in palate-pharyngeal, oro-pharyngeal and hipopharyngeal region [3].

Epidemiological studies are reporting that between 30 -35 years of age snoring is present at 20% of males and at 5% of females, and that around 60 years 60% of the males and 40 % of females are snoring [4]. Respiration correlated sleep disturbances appear twice as frequent in men reported to women, with a prevalence of 20-28% in men and 11-15% in women [5]. The obstructive sleep apnea syndrome, a part of the respiratory related sleep disorder is affecting in USA 30 million persons and after Young et al [6] the prevalence in adult population is 24 % in men and 9 % in women. The following maximum incidences were calculated: 50-59 years in men and 60-

64 years in women with a decrease in elder people [7].

At children, the prevalence is situated between 3,2% and 11% , with age variations [8]; the diurnal symptoms appear at 11% and consist of diurnal sleepiness, behavioral problems: attention deficit, hyperkinetic syndrome, aggression [9].

Snoring is the most common symptom of respiration related sleep disorders of obstructive origin, which has a wide range of presentation: from occasional snoring to obstructive sleep apnea [10]. The pathological importance of snoring was correlated with its intensity (dB), the calendar (interrupted or continuous) and duration reported to sleep.

Occasional snoring relates to pathology of the upper respiratory tract. During the habitual snoring (minimum 3 nights/week) the air inhaled meets a resistance during the passage through the upper respiratory tract. The sleep hyperpnoea is represented by episodes of superficial breathing while the nasal respiratory flux is decreased by 10-50% for up to 10 seconds, associated with a decrease of 3-4% in blood oxygenation that has the same clinical significance as the obstructive sleep apnea [11]. The obstructive sleep apnea appears when the upper respiratory tract is in collapse for more than 10 seconds [12], combined with great respiratory effort (“the struggle to breathe”) which wakes the patient. The American Sleep Disorders Association classifies this pathology in 3 degrees of severity: easy (15 events/hour), medium (15-30 events per hour), and severe (more than 30 events per hour).

Snoring appears also in the upper respiratory tract resistance syndrome for which the diagnostic criteria are not clearly defined. This entity is characterized by the resistance in the upper respiratory tract at air flow, has an episodic appearance in sleep and can



– Moderate								
The obstructive sleep apnea - Severe	*	*	*	*	*	*	*	*
Obstructive sleep Hipopnea	*	*	*	*	*	*	*	*

Snoring represents a marker for the respiration correlated sleep disturbances the guides to an early diagnostic when is associated with obesity, smoking, consumption of alcohol, tranquilizers, muscle relaxant, nasal obstruction, upper respiratory tract infections, menopause, and black race.

Questionnaires are a valuable instrument for the research of snoring, but their use is challenging in practice because there is no measuring standard and no correspondent between the subjective perception and the measuring standard objective [36]. Usually, not the patient complains about the snoring, but the “listener” and this could be one of the causes of the under-diagnostic. Patients

are not able to describe the beginning of the sleep apnea or the fragmented sleep and it is important that the anamnesis of the patient to be performed in the presence of a family member: wife/husband, or other relatives which are sharing the same sleeping area. Generally, the symptoms described by patients are diurnal sleepiness and snoring [37]. Frequently, the patients are addressing to medical specialties for pathologies that have as a substrate the breathing related sleep disturbances (see Table 2). For example, there are several studies that are showing that the obstructive sleep apnea is a risk factor for the arterial hypertension resistant to treatment and for this comorbidity the therapy should be reconsidered [38].

**Table 2. Pathologies associated with snoring**

Cardiology [39]	Arterial Hypertension Heart failure Left ventricular hypertrophy Nocturnal angina pectoris Myocardial infarction Arrhythmia, in special bradi-arythmia Chronical
Psychiatry [40]	Depression Anxiety



	Behavioral problems Acute Delirium
Neurology [41]	Headache Epilepsy Stroke
Urology[42]	Nicturia Erectile dysfunction Impotence
Endocrinology[43]	Hypothyroidism Acromegalia Diabetes
ENT[44]	Snoring Discomfort in the throat Hoarseness
Gastroenterology[45]	Esophageal reflux
Hematology[46]	Policitemia
Pneumology [47]	Nocturnal pauses in breathing Respiratory failure
Anesthesiology[48]	Sensitivity in opioide analgesia and sedation Difficult intubations

The selection of patients suspected of obstructive sleep apnea to participate in a complete study of the sleep is realized by clinical prediction models. For the constitution of these models self reported symptoms were used, and these, combined with demographic and anthropologic data upraised the predictive value of the clinical variables. The sensitivity of these models is high (76 – 96%), but the sensitivity is low

(13 – 54%) [49], but the polisomnographic investigations when these models are used are reduced by 40%. Unfortunately, these models were not validated for population groups as: elder population, ethnic minority or for the primary medical assistance where the aspects of the obstructive sleep apnea can vary [50].

The clinical examination of the snoring patients in unspecific and oriented towards the calculation of body mass index, the detection of anatomical malformation: nasal obstruction, amygdaline and uvular hypertrophy, retrognathia, micrognathia, macroglosia, and parapharyngeal fat deposits and functional anomalies detection: chronically muscle stimulation, adapted hypertrophy of Ila fibers in the constrictor pharyngeal muscle [51] due to high load resistance that modifies the equilibrium between the forces that produce dilatation and collapse on the pharynx. These anomalies are related to the intensity and the frequency of snoring [52].

The differential diagnostic must be made with central sleep apnea and other manifestations that produce diurnal sleepiness: short period of sleep, circadian rhythm anomalies, narcolepsy, and restless feet syndrome.

### Investigations

The imagistic investigations useful for the detection of the obstruction include:

- lateral skull X-Ray for the cephalometric analysis, used for the patients' selection for surgery [53];
- computed tomography
- MRI ultra fast in awake and asleep status, for the soft tissue and other structures around the air ways evaluation;
- Cervical fluoroscopy during sleep;
- Fibro-laryngoscopy combined with Muller maneuver in awake status is used to localize the collapse of the upper respiratory tract: Level I – retropalate; Level II – retropalate and retrolingual; Level III – retrolingual [54] and allows the classification of the severity of the collapse: Grade I – minimal collapse; Grade II – up to 50% reduction of the lumen; Grade III – 75- 100% reduction of the lumen [55].

The majority of these techniques have limitations regarding the evaluation of the localization of obstruction.

Other useful techniques are:

- Nocturnal oxymetry for the detection of sleep hipopneea/apnea syndrome. It is a screening test;
- Cardio-respiratory polygraph recording (can be performed in ambulatory) for the recording of apnea episodes correlated with sleep episodes. Allows the recording of naso-bucal airflow, respiratory movements, laryngeal sounds, esophageal pressure, pulsoximetry, ECG;
- Polisomnography used during all night or to a minimum 2 hours sleeping period, records the following parameters: EEG, electrooculography, EMG on mentonier muscle and other parameters mentioned on the poligraphy. From the data obtained can be calculated:
  1. The hypopneea/ apnea index (the total number of apnea and hypopneea episodes per each hour of sleep);
  2. The medium duration of apnea;
  3. Minimal saturation of oxygenation.

These parameters can be used for the severity diagnostic of obstructive sleep apnea [56]. The disadvantages of the use of Polisomnography are high costs and the limited number of centers in which it can be performed.

Snoring can be also measured by:

- Leq - Equivalent Continuous Sound Level, which is quantifying the level of disturbance to the partner/ auditorium;
  - Power Spectrum used to show the frequency of snoring; offers data about the sound particularities differentiating the non-apneics form apneics.
  - Linear prediction code helps to localize the obstruction (nasal, oral, oro-nasal)
- The laboratory tests are useful to diagnostic, and adapted to the cases' necessity are: TSH, hemogram, ECG, cardiac echography, respiratory functional tests.

## Treatment

Initial measures for treating snoring are changes in life style: weight loss (if necessary), cease smoking, lateral body positioning during sleep with pillows or anti-snoring balls sewed in the collar (to prevent rolling on the dorsal position), avoiding alcohol and sedatives. If the permanent nasal congestion is the cause of snoring vasodilators, nasal decongestion drugs, inhalator corticosteroids in combination with nasal dilators from plastic or stainless steel can be used.

For moderate to severe forms of obstructive sleep apnea the use of devices that assure a fix, positive pressure air flow (CPAP devices) through an air-tight mask placed over the patient's nose that is preventing the collapse of upper respiratory tract during sleep. This treatment is symptomatic and does not cure the sleep apnea. The benefits are limited to the period of time it is used. The effects of the use of CPAP are fast and spectacular, the diurnal sleepiness and the nicturia disappear from the first night of treatment [57]. The secondary effects to the usage of this treatment are: skin lesions, nasal congestion, tubular dysfunction and discomfort due to the presence of the device [58]. Other CPAP devices which are offering a variable pressure depending on the respiratory cycle (inhale and exhale) are easier to use and more comfortable.

In some cases, some surgery procedures can be performed. The American Sleep Disorders Association recommends that the surgery procedures should not be used when sleep apnea syndrome is present [59], because these procedures will convert a snoring sleep apnea in non-snoring sleep apnea disturbing the pre-operator equilibrium of these conditions. The first surgery approach of these conditions was proposed by Ikematsu in 1964 [60] and re-proposed by Fujita et al. in 1981 [61].

Present surgical procedures applied are, depending on the localization and the

gravity of the obstruction: uvulo-palato-faryngoplasty, uvulopalatoplasty with laser, tonsillectomy and adenoidectomy (if the tonsils and the adenoidal vegetation are hypertrophic and are blocking the airways during sleep), polypectomy, nasal septoplasty (if nasal septum deviation is present), maxilla and mandible interventions for the elongation or reducing of the maxilla and mandible, basal tongue interventions, tracheotomy.

The role of oral devices in the management of upper respiratory tract obstruction was recognized since 1902 [62]. As the CPAP, the oral devices do not cure this pathology; their efficacy is limited to the period of time when they are used.

Oral devices change the position of the tongue, mandible, soft palate, hyoid bone and prevent the collapse of the upper respiratory tract during sleep [63, 64, 65, 66, 67], can raise the activity of geniogloss muscle [68] and can shorten the length of soft palate [69].

Although there are a great variety of oral devices used in the treatment of snoring of obstructive causes they can be divided into the following functional categories: 1. devices that place the tongue in protrusion; 2. devices for the mandible repositioning (adjustable or un-adjustable); 3. devices for the mandible repositioning associated with devices that assure a positive pressure air flow.

The oral devices that keep the tongue in protrusion, placed anterior than the normal position by applying a suction pressure and all these are facilitating nasal respiration. The applicability of these devices is linked to a degree of obstruction caused by the obstruction created by the oral device at the base of the tongue [70].

The oral devices for mandible protrusion are positioning the mandible in an advanced anterior position enlarging the posterior air

space. Their efficacy is linked directly to the type of material and design. Although some transitory adverse events that are reducing the tolerability were signalized: dental and temporal – mandible joint discomfort, intense salivation, irritations these device reduce the frequency of snoring at least by 15%, the intensity of snoring by 40% [71] and approximate by 65% the index apnea/hipopnea in sleep [72]. The usage of oral devices reduced the degree of collapse of the upper respiratory tract [73], which was proved by cephalometric study. The computed tomography reveals that there is a modification in the shape of the upper respiratory tract and by in videofluroscopy an increased section in upper pharynx can be seen [74].

Although they have a good efficacy the CPAP devices can not always be tolerated and the therapy not always accepted by patients. On the other hand, oral devices are relative well tolerated, but they are not quite efficace. That is why the use of a hybrid device was proposed so all the benefits of these two devices will be brought together. The results are similar to the use of CPAP devices and the air pressure is lower in the hybrid devices than the simple CPAP.

American Sleep Disorders Association recommends the treatment with oral devices as a first line approach in easy and medium forms of obstructive sleep apnea and an alternative to severe cases when the CPAP device is not tolerated and the surgical intervention is not indicated [75].

## RESULTS AND DISCUSSION

Recently recognized as a problem, the obstructive sleep disturbances correlated with breathing took by surprise by the area of distribution and the wide range of medical and social complications. The prevalence of obstructive sleep apnea is similar in North America, Europe, Australia and Asia and is suggesting that this pathology is present in industrialized

countries and in countries in course of development. 2-4% of middle aged adult population is estimated to have obstructive sleep apnea. The great majority of these cases are unrecognized and untreated [76].

The subdiagnostic of the obstruction respiration related sleep disorders can be adjusted by a well coordinated strategy on the following dimensions:

1. public education – the elaboration, application and evaluation of national campaigns for the general public information, oriented on the high risk population segments
2. the creation of work places for clinical and scientific demands in this field for health professionals
3. the diagnostic, treatment, monitoring – the elaboration of the criteria and strategies for the management of snoring, the development of new diagnostic and therapeutic technologies
4. the creation of an environment where the results of research and education could be used for the prevention, early diagnostic and the reduction of the complications; the existence of investments in interdisciplinary research projects for the development of laboratories and centers of sleep pathology.

An important role in the diagnostic of the patients with permanent snoring during sleep has the primary medical assistance. For the efficient screening and treatment orientation of the patients the primary medical assistance should have clinical guides for determination of the necessity of a sleeping test. Snoring, the constant parameter in this condition, easy to determinate can be the key element in the elaboration of the screening instruments.

The oral devices can be used, besides the general methods of treatment from habitual snoring to obstructive sleep apnea. The application of oral devices is un-invasive, efficient and not expensive. The use of oral devices asks that medical and dental professionals act as a team. In present, there

aren't dental professionals able to set the diagnostic of obstructive sleep apnea/hipopneea, and to differentiate the habitual snoring from this condition. Similar, the medical doctors do not have competences to built, adjust and use an oral device, or treat dental malpositioning, temporal – mandible joint dysfunction or malocclusions.

The measures for the reduction of the breathing related sleep disturbances on occupational accidents and traffic accidents should be oriented on the establishment of the specific clinical criteria and degrees of severity of the clinical variables, the facilitation of patient's investigation and treatment evaluation, the creation of the legal environment for the periodic testing especially of professional drivers. In European Community, since July 29th 1991 a directive was published in the Official Journal 24/08/91, No. L237/1-24, and this directive was applied since July 1st 1996. In Annex III contains the list of conditions incompatible with the obtaining of the driver's license and diurnal sleepiness and sleep apnea syndrome are among them. In Paragraph 18 of the directive suggests that the opportunity to obtain the driving license should not be granted to persons that are suffering from other disturbances other than those from the list that could affect the traffic safety, excepting those that have medical authorization. There are countries (B, E, F, S, UK, and NL) that have already regulated that sleep apnea syndrome and narcolepsy are among the pathologies that are not accepted for those who want to obtain the driving license unless effective treated. But the term effective treatment is

not clear defined and some countries have regulated the period of treatment from 1 to 6 months and that diurnal sleepiness is missing for 5 years. Similar, the frequency of reevaluation is varying from 1 to 3 years. These deficiencies are underlining the necessity that adequate settlement should be made, so the patient and other traffic participants should be protected by the potential risk. Any settlement should include a joint responsibility for the patient, the medical doctor and the authority for the driving licenses.

Similar to traffic accidents, the occupational accidents are more frequent in the presence of respiration related sleep disturbances [77]. It is necessary that the occupation of high risk to be settled.

Recent epidemiological studies have revealed that, in Europe approximately 5 millions persons are susceptible of the hipopneea/apnea sleep syndrome and this classifies this syndrome for the second position after the asthma in the highest prevalence of respiratory chronic pathologies. The clinical facilities for the investigation and the management of the condition of these patients are representing a challenge for the health services of each European state. Nevertheless, the report of cost/benefit is leaned towards benefits: there are proofs that after a 10 years period before the diagnostic patients have had twice as bigger costs for medical assistance [78]. Bahammam et al. [79] are underlining that "early diagnostic and treatment for patients with sleep apnea wouldn't be a burden for the health services, because, in reality it would semnificative reduce the costs".

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# DRUG USING BY ROMANIAN ADOLESCENTS – PATTERNS OF USE AND RISK FACTORS

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## REZUMAT

*Utilizând ancheta epidemiologică aplicată unui număr de 2908 elevi din mediul urban al județului Timiș, cu ajutorul “Chestionarul CORT 2004 privind comportamentele cu risc pentru sănătate la tineri”, articolul de față își propune conturarea factorilor de risc intrafamiliali și de personalitate vis-a-vis de consumul drogurilor ilicite la adolescenții timișeni. Din totalul celor chestionați, consumatorii (158 declarați) corespund unui procent de 3,4% (50) din totalul fetelor și 5,2% (73) din totalul băieților, marea majoritate a elevilor declarând consumul de marijuana (85 băieți și 53 fete). Referitor la structura și dinamica familială, remarcăm ca și comportamente predictive: indiferența manifestată de către tată (OR = 1,512, 95% CI : 1,188-1,924), consumul de droguri al mamei (OR = 3,788; 95% CI: 2,093-6,856), precum și consumul de droguri al fraților și/sau surorilor (OR = 3,410; 95% CI: 2,271-5,122). Tendințele personale de comportament orientate către agresivitate și extraversiune (agresivate: OR = 1,298; 95% CI: 1,139-1,479 și extraversiune: OR 1,163; 95% CI: 1,018-1,329) reprezintă de asemenea factori predictivi ai consumului drogurilor ilicite.*

**Cuvinte cheie:** elevi, droguri ilicite, factori de risc, familie, personalitate

## ABSTRACT

*The present study used the „CORT 2004 Questionnaire Regarding Risk Behavior for Health in Young People” for the epidemiological survey on a number of 2908 students in the urban area of Timis County. The aim of this study is to delineate the risk factors present inside the family medium and the personality risk factors related to illicit drug use in Timis County adolescents. Of the total number of respondents, the consumers (158 declared) correspond to a percent of 3.4% (50) of total girls and 5.2% (73) of total boys, the overwhelming majority of students declared they used marijuana (85 boys and 53 girls). Concerning the family’s structure and dynamic we can point out some predictive behaviors: indifference put forth by the father (OR = 1.512, 95% CI: 1.188 – 1.924), mother’s consumption of drugs (OR = 3.788; 95% CI: 2.093 – 6.856) as well as the consumption of*

*illicit drugs by the siblings (OR = 3.410; 95% CI: 2.271 – 5.122). Personal behavior tendencies towards aggressiveness and extraversion (aggressiveness: OR = 1.298; 95% CI: 1.139 – 1.479 and extraversion: OR = 1.163; 95% CI: 1.018 – 1.329) also represent predictive factors for the illicit drugs use.*

**Keywords:** *students, illicit drugs, risk factors, family, personality*

## INTRODUCTION

The use of tobacco, alcohol and other drugs among young people is of great concern in most countries. That is why in many countries a lot of studies have been conducted in order to gain a better understanding of consumption patterns. “Traditionally, in spite of the significant number of studies conducted in many countries, it was rather difficult to obtain a comprehensive picture and more to the point to compare the levels of alcohol and drug use prevalence in different countries. However, when students are the selected as population for study, there are usually no other realistic ways of collecting data, other than using group administrated questionnaires in the schools (usually in the classrooms)” [1].

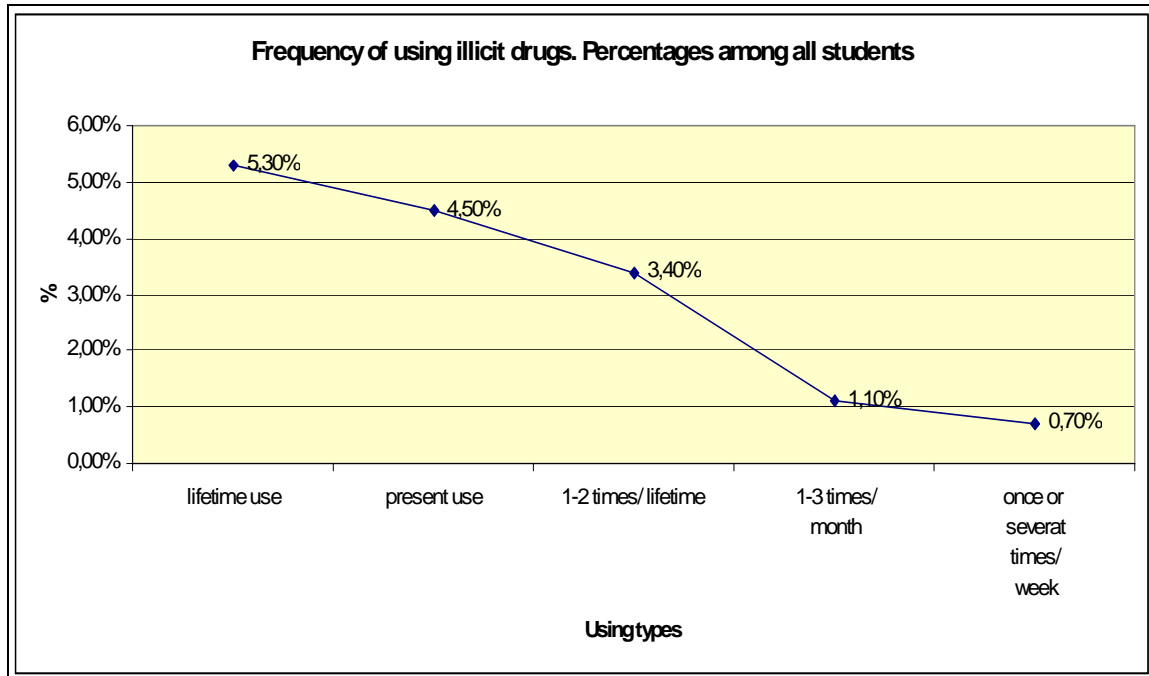
## MATERIAL AND METHODS

The results of this study are based on the epidemiological survey using “The CORT 2004 Questionnaire Regarding Risk

Behavior for Health in Young People”, applied in 2003 – 2005 to a representative sample composed of 2908 young people in the high schools, colleges and professional schools in the urban area of Timis County. The rate of the students answer was 76.2%, the rate response of the classes (the primary sampling unity) was 97.9%, and the response rate resulted was 74.6%. The CORT Questionnaire 2004 includes 126 items which investigates, beside drug consumption, risk behavior such as smoking cigarettes, the consumption of alcoholic beverages, aggressive behavior (both hetero- and auto aggressive), and behaviors with high risk of conducting to traffic incidents, sexual behavior, alimentary behavior, sedentary behavior, self-medication, as well as healthcare and the level of health education. Data processing was realized in the program EpiInfo version 6.04d, 2001 and the program SPSS, version 10. The chi square test was used for comparing frequency’s distribution. Also a correction factor was applied, factor that made allowances to the sampling probability and to the participation rate [2].

## RESULTS AND DISCUSSIONS

### Prevalence of boys and girls who use any illicit drugs (Figure 1)

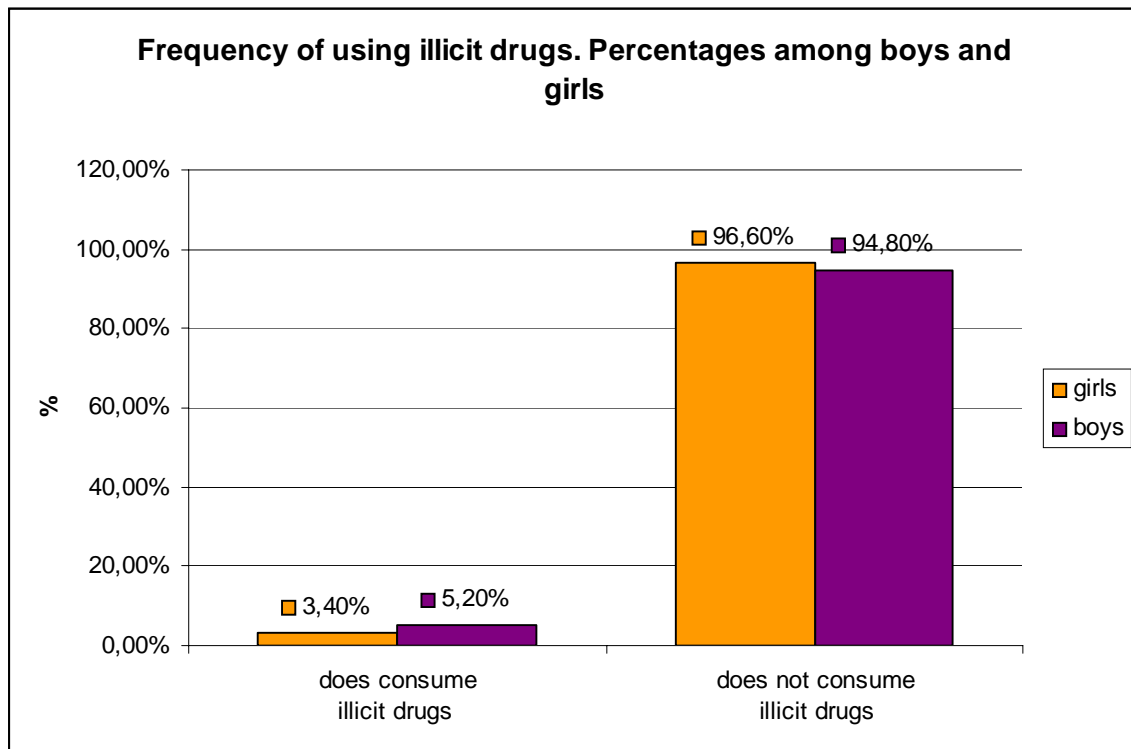


**Figure 1. Frequency as types of using any illicit drugs – CORT 2004**

At the time of the study the percent of consumers of illicit drugs (4.5%) was higher than the reported national media (3 %) for the consumption of marijuana for the entire life time within ESPAD 2003 Study, the European media being 21%, with a higher prevalence in boys (5.2%, respectively 73 students). By comparison with the data in the ESPAD 2003 Study, we can point out the percent of students from Timis County, consumers of drugs, is very similar to the one of students from Cyprus and Turkey

(4% for both) and far from the ones of students from Czech Republic (44%), Ireland (39%) or France (38%). The same percent (3%) we can point out for Romania within The ESPAD Study in the case of alcohol mixed with drugs consumption, the European media being 7% [1].

Analyzing Figure 2, we remark that boys develop a higher tendency than girls to use illicit drugs.

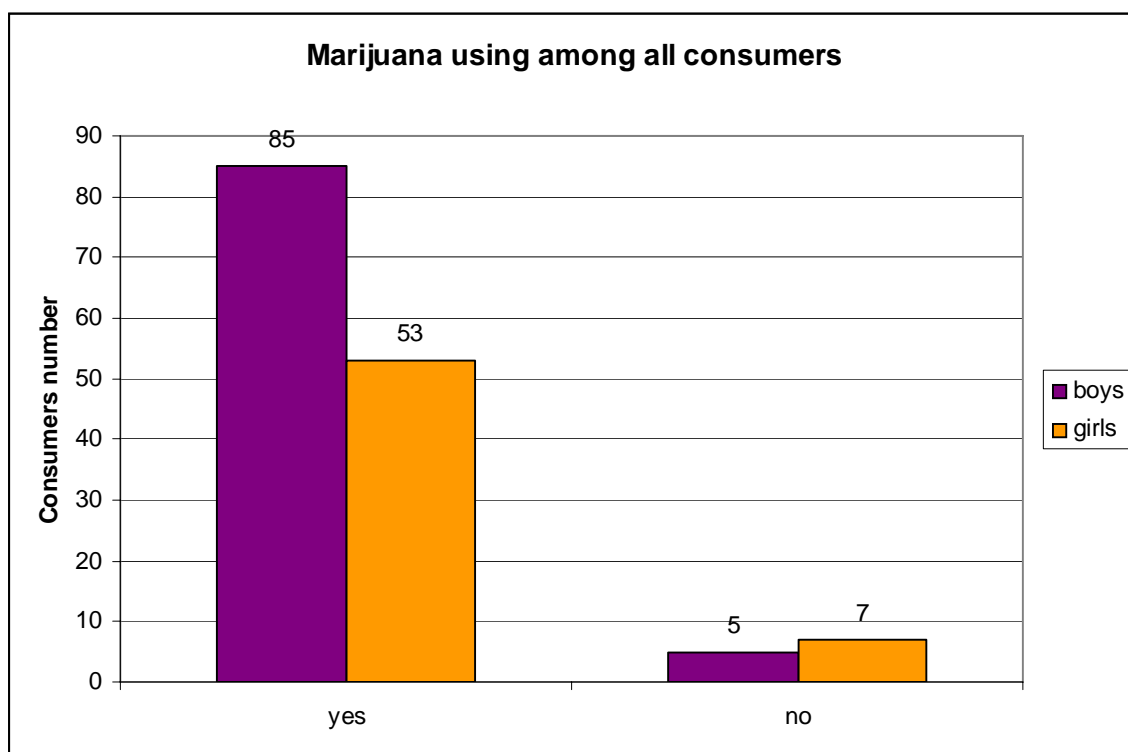


**Figure 2. Comparative distribution between boys and girls in using any illicit drugs – CORT 2004**

Compiling a top of illicit substances consumed by the total consumers number who responded the questionnaire (151), we can see on the first place the cannabinoids derivates (91.3%, 138 students), followed on the second place by ecstasy (10.0%, 15 students), on the third place by LSD (8.6%, 13 students), and then cocaine (7.9%, 12 students), tranquilizers or sedatives (7.3%, 11 students), alcohol mixed with tranquilizers (5%, 8 students) and organic

solvents (4.6%, 7 students). 5 students declared to have consumed hallucinogen mushrooms, 3 students declared to have consumed amphetamines and also a number of 3 students declared to have consumed anabolic steroids.

Corresponding Figure 3 we can point out that the majority of illicit drugs consumers have recourse to marijuana.



**Figure 3. Proportion of marijuana smokers among all consumers - CORT 2004**

The percent of students from Timis county who use illicit drugs different of cannabinoids (the maximum percent is represented by ecstasy consumers: 0.5%, respectively 15 students) represent a quarter of the national percent (2%) reported within The ESPAD 2003 Study (similar with countries like Faeroe Island, Greece and Ukraine), while the European media is 6%. Consumers who used in the last 12 months these drugs are found in a percent of 1% in countries like Romania, Finland, Faeroe Island and Turkey [1-4].

#### **Personal and familial risk factors of using illicit drugs (Figure 4)**

Using binary logistical regression of psychological characteristics for nonconsumers and for experimental type consumers (once or twice over the lifetime) we can point out that the tendencies in behavior toward aggressiveness and

extraversion represent risk factors of using illicit drugs (aggressiveness: OR = 1.298; 95% CI: 1.139-1.479 and extraversion: OR 1.163; 95% CI: 1.018-1.329).

Referring to the influence of maternal behavior on the consumption behavior of students, the consumption of illicit drugs by the mother represents the most influential risk factor (OR = 3.788; 95% CI: 2.093 – 6.856). In the same manner, the verbal attack on the student by the mother (OR = 1.407; 95% CI: 1.120 – 1.768) and (probable) mother's cigarette smoking (OR = 1.512, 95% CI: 1.056 – 1.483) are next as importance.

In the analyze of the paternal behavior, on the first place as importance among the risk factors for illicit drugs consumption by students, we can point out the indifference displayed by the father (OR = 1.512, 95% CI: 1.188 – 1.924).



**Figure 4. Personal and familial predictive factors in using illicit drugs in the adolescence- CORT 2004**

Other behaviors displayed by the father that may influence the illicit drugs consumption, in order of importance, are: driving the car after alcohol consumption, turning to obscene words and cursing, the verbal agresivity with people who doesn't belong to the family, physical aggressivness with others members of the family, and (probable) the smoking habit.

In the relation with the siblings, the highest influence belongs to them consuming illicit drugs (OR = 1.326; 95% CI: 1.072 – 1.640), the verbal attack on people outside the family (OR = 1.422; 95% CI: 1.081 – 1.871) and the carelessness for the student (OR = 1.447; 95% CI: 1.083 – 1.933).

## CONCLUSIONS

Illicit drugs consumption amongst the students in Timis County is a reality, and the percent of 5.3% students which consumed illicit drugs and 4% which still consumed drugs at the time of the study – although ones of the smaller in Europe – must be taken into account by the structures involved in the comunitary intervention, both preventive and therapeutically.

The influence of familial risk factors, added to the personality typology of the drugs consuming student (orientated to



extraversion and aggressiveness), uphold once more the necessity of family and systemic psychotherapeutically interventions within psychological therapies [5,6]. Thorough interdisciplinary studies are needed for the deliniation of effective

preventive methods. A real education for health in schools will demand as a sine-qua-non condition that the school physician, the psychologist, the social worker and the family members work together [7-11].

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# DRUG USE OF TIMIS COUNTY'S ADOLESCENTS – PERCEIVED RISK OF SUBSTANCE USE

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## REZUMAT

*Utilizând ancheta epidemiologică aplicată unui număr de 2908 elevi din mediul urban al județului Timiș, cu ajutorul “Chestionarul CORT 2004 privind comportamentele cu risc pentru sănătate la tineri”, articolul de față are ca scop analiza opiniilor elevilor privind riscurile fizice sau de orice natură consecutive consumului de droguri ilicite. Din totalul celor chestionați, consumatorii (158 declarați) corespund unui procent de 3,4% din totalul fetelor și 5,2% din totalul băieților. Din totalul eșantionului, cele mai mari procente corespund elevilor care cred într-un risc crescut în cazul uzului de marihuana, indiferent de modelul de consum: experimental (43,8% fete și 36,6% băieți), ocazional (45,1% fete și 38,6% băieți) sau regulat (65,5%). Există totodată un procent variind în intervalul 20-35% din totalul respondenților, care nu au știut ce să răspundă întrebări fiind de implicațiile riscurilor consumului de droguri ( $p \leq 0,000$ ). Din totalul consumatorilor de tip experimental de droguri ilicite (98), cel mai mare procent (56,1%), respectiv 55 elevi, cred într-un risc crescut al consumului regulat de marijuana, iar 23 (23,4%) susțin un posibil risc moderat. Dintre cei 20 de consumatori de tip frecvent, 7 susțin un risc scăzut al consumului, 4 cred într-un risc moderat și 2 într-un risc crescut ( $p \leq 0,000$ ).*

**Cuvinte cheie:** elevi, droguri ilicite, riscuri de consum

## ABSTRACT

*The present study used for the epidemiological survey the “CORT 2004 Questionnaire Regarding Risk Behavior for Health in Young People”, on 2908 students in the urban area of Timis County. The aim of this study is the analysis of the students' opinion regarding risks, either physical or of any other nature, following the use of illicit drugs. Out of the total number of respondents, the drugs consumers (158 declared) represent a percent of 3.4% related to total girls and 5.2% related to total boys. The highest percent correspond to the students which believe there is a high risk in case of marijuana use, regardless of the consumption pattern: as an experiment (43.8% girls and 36.6% boys), occasional (45.1%*

girls and 38.6% boys) or regular (65.5%). There is, nevertheless, a percent of the total number of respondents floating in the interval 20-35% that did not know how to respond the questions on the connotations of drugs consumption ( $p \leq 0,000$ ). From the total number of illicit drugs experimental consumers (98), the highest percent 56.1% (55 students) believe there is a high risk of regular marijuana consumption and 23 (23.4%) uphold a possible moderate risk. From the frequent type consumers (20), 7 students uphold a low risk for this consumption, 4 students believe in a moderate risk and 2 students believe the risk is high ( $p \leq 0,000$ ).

**Keywords:** students, illicit drugs, consumption risks

## INTRODUCTION

Health effects of tobacco, alcohol and drug consumption are real and dangerous on the individual as well as the societal level as a whole. The negative aspects are of great concern in the medical research. Not only the medical and educational fields, but Governments and major international bodies as the United Nations and the European Union are constantly looking for policy measures to reduce the negative impact of the use of different substances (such as tobacco, alcohol and different kinds of illegal drugs).

The wellbeing of young people is of special concern in all societies, and ongoing efforts are made to reduce all types of dangerous behaviors.

Most countries have laws in place that restrict the availability of these substances. The legal regulations may vary between countries but many of them include limitations especially targeted to young people” [1].

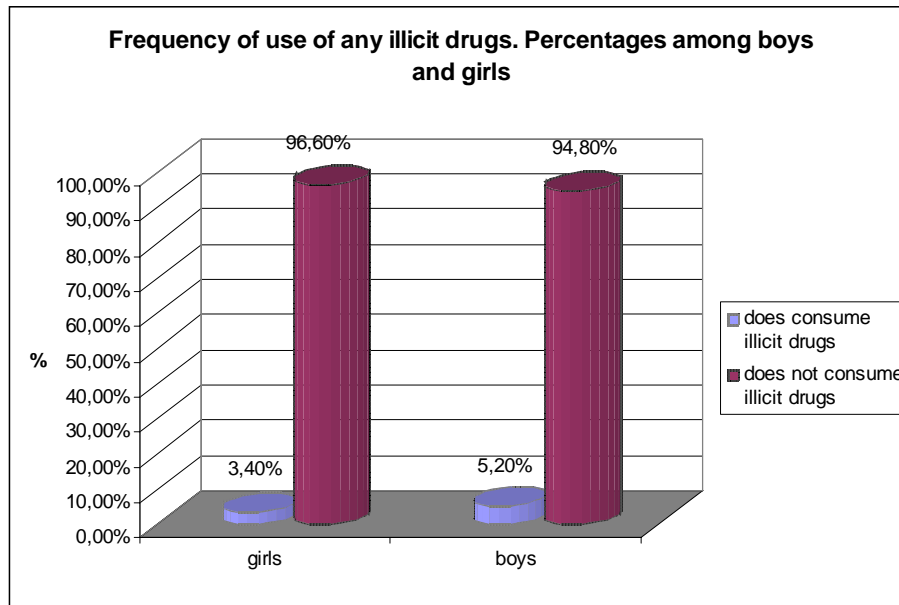
## MATERIAL AND METHODS

The results presented in this article are based on an epidemiological survey that used the „CORT Questionnaire Regarding

Risk Behaviors for Health in Young People”, applied between 2003 – 2005 on a representative sample composed of 2908 adolescents in the high schools, secondary schools and professional schools in the urban area of Timiș County. The response rate for the students was 76.2%, the response rate of the classes (the primary sampling unity) was 97.9%, and the response rate resulted was 74.6%. The CORT Questionnaire 2004 includes 126 items which investigates, beside drug consumption, risk behavior such as smoking cigarettes, the consumption of alcoholic beverages, aggressive behavior (both hetero- and auto aggressive), and behaviors with high risk of conducting to traffic incidents, sexual behavior, alimentary behavior, sedentary behavior, self-medication as well as healthcare and the level of health education. Data processing was realized in the program EpiInfo version 6.04d, 2001 and the program SPSS, version 10. The chi square test was used for comparing frequency’s distribution. Also a correction factor was applied, factor that made allowances to the sampling probability and to the participation rate [2].

## RESULTS AND DISCUSSION

**The prevalence of drug consumption in Timisoara students (Figure 1)**

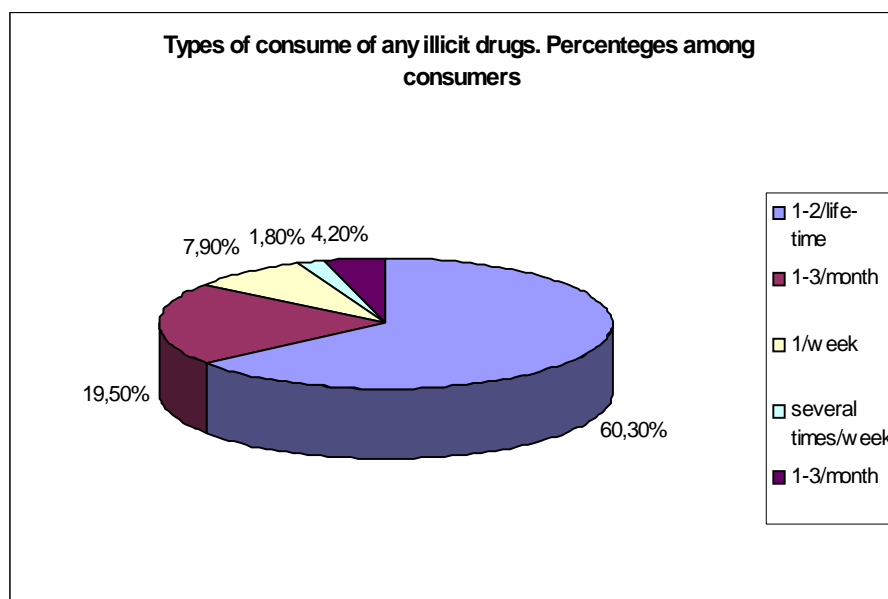


**Figure 1. Frequency of consume of illicit drugs (comparison between boys and girls) – CORT 2004**

As you can see in the figure, the drug consumption is higher in boys, the percent of consumers in Timiș County in the moment of the study being somewhat higher than the reported national level in ESPAD 2003 study, where Romania was on the lowest level on cannabis experimental use (3%), very similar with Cyprus and Turkey (4% each), Greece (6%) and Sweden (7%).

The higher proportion of lifetime experiencing marijuana or hashish was found in: Czech Republic (44%), Switzerland (40%), Ireland and Isle of Man (39% each) and France (38%). (The number of students reporting experience with cannabis is almost identical with the total illicit drug prevalences) [2,3].

**The most important illicit drugs used by the Timiș County students (Figure 2)**



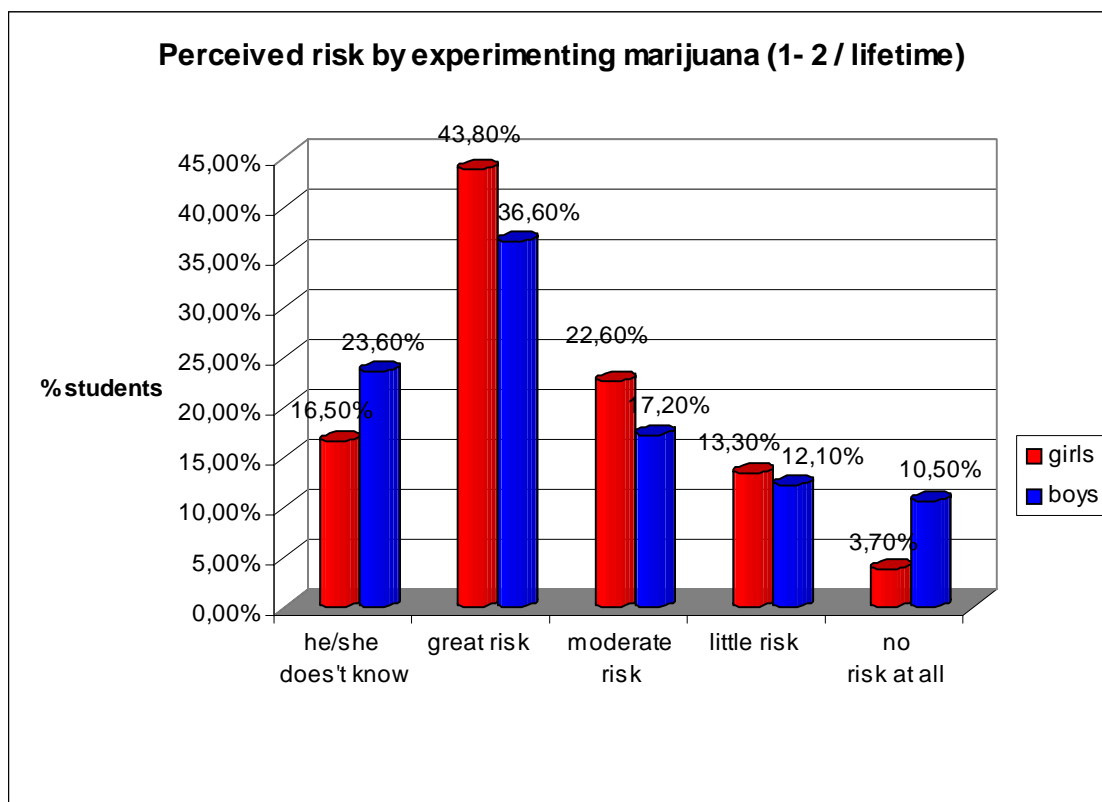
**Figure 2. Types of consume of illicit drugs- CORT 2004**

The most outspreaded consumption pattern is the experimental type (once or twice during lifetime), at the same time the most infrequent percent is represented by the pattern with the most serious implications for health, meaning many times a week. Regarding the frequency of the illicit drug used, from the total responding consumers (151), on the first place there are the derivates of cannabis (91.3%, 138 students), followed by ecstasy (10.0%, 15 students),

LSD (8.6%, 13 students), cocaine (7.9%, 12 students), tranquilizers (5%, 8 students) and organic solvents (4.6%, 7 students).

5 students consumed hallucinating mushrooms, 3 students consumed amphetamines and 3 consumed anabolic steroids.

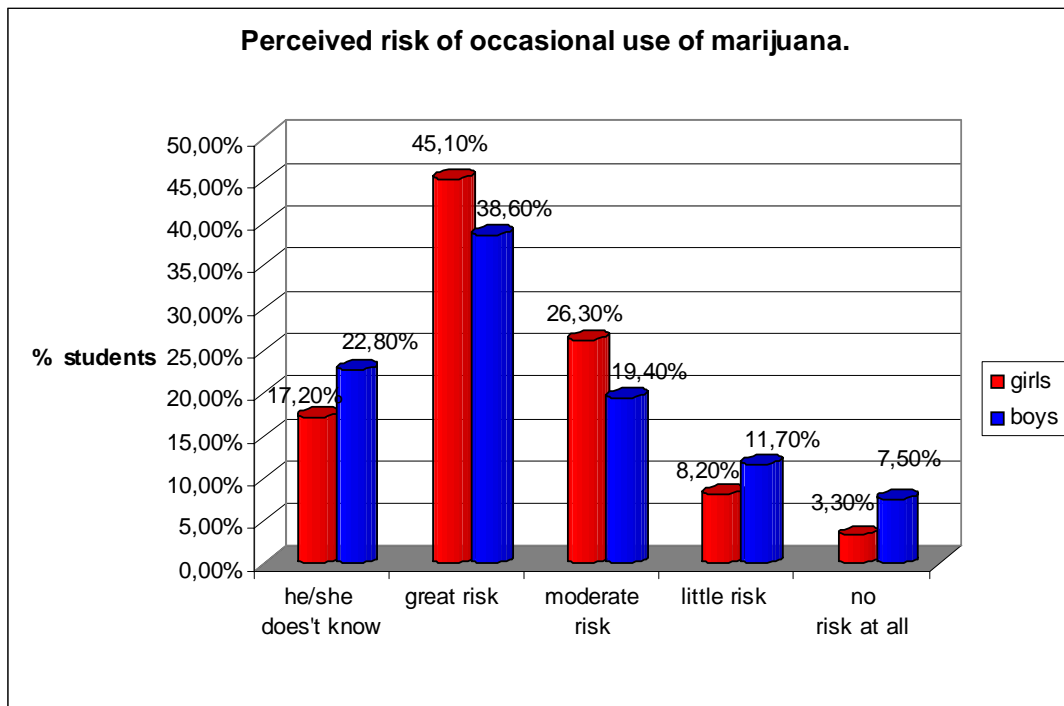
**Perceived risk of using illicit drugs by adolescents (Figure 3-5)**



**Figure 3. Perceived risk of experimenting marijuana by smoking. Percentage among all students – CORT 2004 (p ≤ 0,001)**

From all 2851 respondents at the issue concerning healthy risk consequences of using 1-2/lifetime marijuana by smoking, more students, 643 girls (43.8%) and 506 boys (36.6%), believe in the terms of great risk. The proportion of students who have no clear opinion concerning the risk

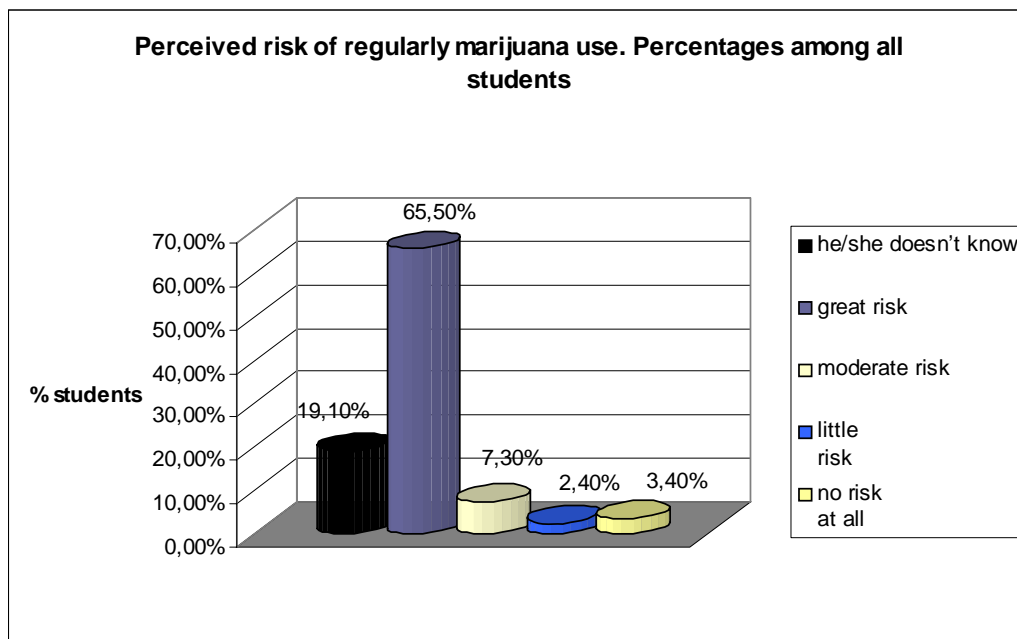
involved by experimenting marijuana is quite significant: 243 girls (16.5%) and 326 boys (23.6%). The proportion of girls who think that experimenting marijuana cannot harm at all is three times smaller than that of boys: 55 girls (3.7%) and 145 boys (10.5%).



**Figure 4. Perceived risk of using occasionally marijuana by smoking. Percentage among all students – CORT 2004 ( $p \leq 0,000$ )**

Similar to the previous figure, the proportion of students who don't know in which way the occasional use of marijuana by smoking influences the health condition is significant: 252 girls and 315

boys. Comparative to the answer concerning the implication of experimental use of marijuana the boys' proportion who are concerned of a moderate and little risk, increased.



**Figure 5. Perceived risk of regular smoke of marijuana. Percentage among all students – CORT 2004 ( $p \leq 0,001$ )**

The majority of students (1904) use to associate the regular use with a possible greater risk as consequence. The proportion of those who have not a clear opinion remains large enough: 556 students (19.1%).

### The consumers' perception regarding the risks to which are exposed due to occasional usage of illicit drugs (Table 1)

**Table 1. The consumers' perception regarding the risks to which are exposed occasional consumers**

	<i>Respondents</i>	<i>Frequency of consume</i>				<b>Total</b>
		<b>Never</b>	<b>1-2/ lifetime</b>	<b>1-3/ month</b>	<b>1 or several times/week</b>	
<b>He/she doesn't know</b>	<i>Number</i>	554	5	2	4	565
	<i>Percentage</i>	98.1%	0.9%	0.4%	0.7%	100.0%
<b>Great risk</b>	<i>Number</i>	1172	20	2	1	1195
	<i>Percentage</i>	98.1%	1.7%	0.2%	0.1%	100.0%
<b>Moderate risk</b>	<i>Number</i>	610	32	9	5	656
	<i>Percentage</i>	93.0%	4.9%	1.4%	0.8%	100.0%
<b>Little risk</b>	<i>Number</i>	244	27	7	5	283
	<i>Percentage</i>	86.2%	9.5%	2.5%	1.8%	100.0%
<b>No risk</b>	<i>Number</i>	119	14	12	8	153
	<i>Percentage</i>	77.8%	9.2%	7.8%	5.2%	100.0%
<b>Total</b>		2699	98	32	23	2852
		94.6%	3.4%	1.1%	0.8%	100.0%

The minimum expected frequency is 1.23;  $p \leq 0,000$ .

### The consumers' perception regarding the risks to which are exposed due to regular consumption

From the total number of experimental type consumers of illicit drugs (98), the highest percent 56.1% (55 students) believe there is a high risk in regular use of marihuana. 23 students (23.4%) believe in a possible moderate risk, 8 (8.1%) do not know what to respond, 7 (7.1%) do not believe there is a

risk and 5 (5.1%) believe the risk is rather low. Among frequent type consumers (20), 7 grant a low risk for this consume, 5 do not know what to respond, 4 believe in a moderate risk, and the numbers of those who do not believe there is any risk and of those who believe in a high risk are equal, meaning two students ( $p \leq 0,000$ ).

**A comparison between consecutive risks for using illicit drugs – ESPAD 2003 and CORT 2004 (Table 2-4)**

Students' answers in CORT 2004 Study on the perception of high risks for health in the case of experimental and frequent patterns

of consume for marijuana, ecstasy and LSD are much alike the answers given by Romanian students, both male and female, during ESPAD 2003 Study. Important differences are appearing in marijuana experimental consume pattern, the students from Timisoara being less tempted to consider high risk of any nature. For experimental consume pattern of marijuana, the „I don't know” answers vary between 16.5% and 19.1%, respectively regular consume pattern (243, respectively 556 students, both sexes), and they vary between 26% and 23.4% (739, respectively 664 students, both sexes) if we refer to ecstasy[1-3].

**Table 2. A comparison between high risk perception in the case of ecstasy consumption – ESPAD 2003 and CORT 2004**

Study	Experimental consumption pattern		Regular consumption pattern	
	Boys	Girls	Boys	Girls
<b>Respondents ESPAD 2003</b>	42.0%	43.0%	58.0%	68.0%
<b>Respondents CORT 2004</b>	40.5%	44.4%	57.8%	72.0%

**Table 3. A comparison between high risk perception in the case of LSD consumption – ESPAD 2003 and CORT 2004**

Study	Experimental consumption pattern		Regular consumption pattern	
	Boys	Girls	Boys	Girls
<b>Respondents ESPAD 2003</b>	44.0%	42.0%	55.0%	59.0%
<b>Respondents CORT 2004</b>	39.4%	42.3%	52.4%	59.8%



**Table 4. A comparison between high risk perception in the case of marijuana consumption – ESPAD 2003 and CORT 2004**

Study	Experimental consumption pattern	
	Boys	Girls
<b>Respondents ESPAD 2003</b>	50%	52%
<b>Respondents CORT 2004</b>	36.6%	43.8%

According to the results of the 2003 ESPAD Report:

- Taking marijuana or hashish once or twice is on average not seen as a very risky behavior. Only one third of the students think so. In only two countries (Lithuania with 58% and Romania with 51%) more than half of the students answered this. The lowest figure is found in Isle of Man (11%), followed by the Netherlands (12%), the Czech Republic, Switzerland, the United Kingdom (13% each), Belgium, Germany (14% each), Denmark and Ireland (15%).

- On average 70% of the students thought that regular use of cannabis would implicate great risk. In USA the corresponding figure is 66%.

- Regular use of LSD is overall considered as a greater risk than occasional use, but the average is similar to the regular use of cannabis (69%). The countries where most students thought that regular use of LSD would be risky include Finland, Iceland (86% each), Poland (81%), the Czech Republic and Lithuania (78%). The lowest number of students who agreed with this statement is found in Turkey (44%). Other countries with somewhat low percentages are the Netherlands (55%) and Romania (58%). The

corresponding figure for USA is 83%.

- Regular use of ecstasy is viewed upon in a different way than occasional use. On average 73% of the ESPAD students regard such use as a great risk. The highest numbers indicating this are found in Iceland (86%), the Faeroe Islands (85%), Finland, France, Ireland, Malta, Poland (82% each) and Denmark (81%). Rather few students in Turkey (44%) and Ukraine (58%) thought this to be a great risk” [1,4-6].

## CONCLUSIONS

The shifting of status for Romania from a transition country for drugs to a consuming country is even reflected by the percent of students which are consumers (3.4% of girls and 5.2% of boys). Speaking about the perception of risk, either physical or of any other nature, as a result of marijuana consumption – the main drug consumed by students in Timiș County – the highest percent of the students uphold the existence of a high risk regardless the nature of the consumption (experimental, occasional, or regular); thus for the regular consumption pattern, 65.5% of the respondent students display this point of view, this percent being almost identical to the one of adolescents of U.S.A. (66.0%) and lower by a few percents

than the European media (70.0%). The percent of students that believe a regular consumption of ecstasy implicate high risks is similar amongst the students in the CORT 2004 Study and the Romanian students in the ESPAD 2003 Study, European media is 73.0%, and the percent of Romanian students is one of the lowest, similar to Ukraine (58.0%).

The opinion of the students in the CORT 2004 Study about possible risks in LSD consumption is almost identical to the national media in the ESPAD 2003 Study, the LSD being the third drug as frequency used by the students in the studied sample [7-9].

It is noticeable a relative significant percent (between 20% and 30%) of students that do not know how to answer the question about

risks determined by the consumption of drugs, although 70.0% of the total number of respondents, 80.0% of the experimental pattern consumers and 65.3% of those who use regular illicit drugs admit they were informed in the school or in the medical facility about the effects of drug use.

Despite the high percentage of students knowing the use of illicit drugs present a high risk for health, the percent of consumers who were advised about the effects of drugs use remains extremely high. This aspect is implicating the necessity of more deepened studies on the possibility of delineating the most efficient ways of prevention by means of information campaigns aimed towards young people [10,11].

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# PARTICULARITIES OF THE EDUCATIONAL SYSTEM FROM THE VOCATIONAL HIGH SCHOOL FROM TIMIȘOARA

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## REZUMAT

*Învățământul din liceele vocaționale prezintă o serie de particularități care cer, pe lângă o pregătire de cultură generală solidă și o muncă susținută, disciplină deosebită și renunțarea la o parte din timpul liber. Am luat în studiu elevii și profesorii unui liceu de muzică din Timișoara și am investigat impactul pe care îl are desfășurarea procesului de învățământ din punct de vedere al suprasolicitării neuropsihice, atât asupra personalului didactic, cât și asupra elevilor. De asemenea, am depistat posibilele efecte negative ale studiului diverselor instrumente asupra dezvoltării ulterioare a copiilor și adolescenților, cu ajutorul chestionarelor, examenului clinic, al determinărilor de zgomot și al audiometriei. Rezultatele arată că munca instrumentiștilor se încadrează în categoria activităților cu efort fizic redus, dar cu solicitare neuropsihică și cu expunere la factori fizici, în special zgomot. Acțiunea simultană a acestor solicitări indică activitatea lor ca fiind o muncă complexă, cu o patologie specifică.*

**Cuvinte cheie:** învățământ, profesori, elevi, muzică

## ABSTRACT

*The educational system from the vocational high schools has a series of particularities which demand a large amount of discipline and giving up part of its free time, in addition to a solid general knowledge and sustained work. Regarding this study, the teachers and students of a musical high school from Timisoara were taken into consideration, studying their neuro-psychical overstress at work. Possible negative effects of study produced by the study of several musical instruments were also found, regarding children and teenagers development. This was done using questionnaires, clinical exams and noise determinations. Results show that the musical instrument player's work fits into the reduced physical effort category, with a high neuro-psychical overstress and physical factors exposure, especially noise. The simultaneous action of these overstresses shows their activity as being a complex activity with a specific pathology.*

**Keywords:** educational system, teachers, students, music

## INTRODUCTION

In recent days when, due to the harmonization to the laws and European requirements different fields are demanding changes, the education reform implies efforts to be made to reduce the neuro - psychic overstress of teachers and students without creating prejudices to the quality of educational process. In this context it is interesting to analyze a special segment of pre-university education: the vocational education.

## MATERIAL AND METHOD

The study was realized on 2 groups of musicians from a musical high school from Timisoara:

- Professional music players – the teachers
- Trainees music players – the students

The groups composed of 34 teachers and 81 students were assigned in four categories depending on the instrument they are playing: piano, woodwind instruments, chords instruments and percussion instruments:

- piano players: 10 teachers and 24 students
- woodwind instrument players: 10 teachers and 20 students
- chords instruments players: 12 teachers and 27 students
- percussion instruments players: 2 teachers and 10 students

The teachers that participated in the study had between 4 and 25 years of work and 2/3 of them had extra school musical activity.

The neuro-psycho-sensorial and postural stress were investigated, also the work characteristics and the work environment were analyzed.

The results of neuro - psycho – sensorial tiredness were compared with the results of a prior study that included 74 teachers and 112 students from gymnasium [3].

As bench-marks for the evaluation of neuro - psycho stress and tiredness of teachers the following unspecific body indicators for response were used [3,7]:

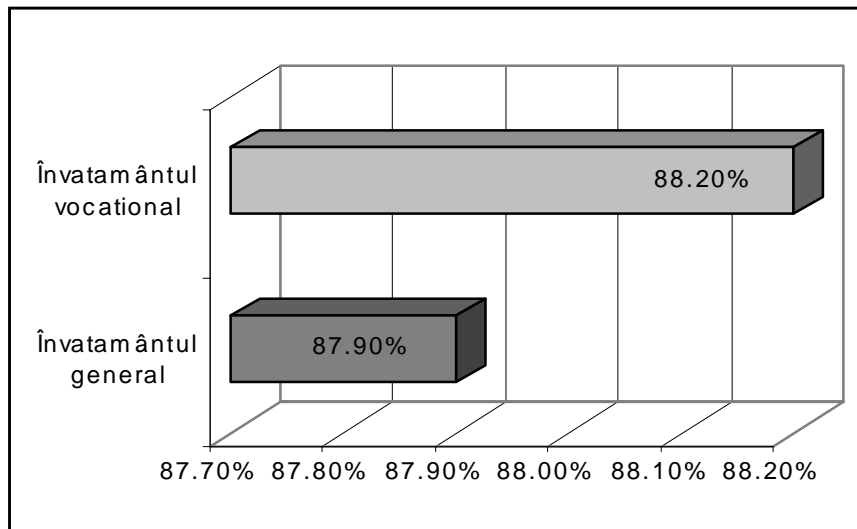
- Physiological indicators
  - cardiac frequency
  - arterial blood pressure
- Psycho – physiological indicators
  - ocular accommodation and ocular convergence
- Psychological indicators
  - the critical frequency of fusion for luminous images
  - the reaction time in visual, hearing stimuli and their combination
  - group psychological tests: Pieron, Kraepelin, Praga
- Psycho – behavioral indicators
  - the frequency of reported complains (psycho – affective, neuro – vegetative, sensitive – sensorial, sleep disturbances and social insertion) – through questionnaires
- Questionnaires for the investigation of the tiredness phenomenon [1,2,5,7] depending on the teaching hours/week, the necessary time for preparing the materials that will be presented, the necessity to complete the lessons with new information, the existence of more tiresome lessons, the possibility to have interactive lessons, the possibility to use modern techniques for teaching, the existence of any preferences regarding the daily schedule and extra scholar musical activity [4,6].

For the students the following indicators were used:

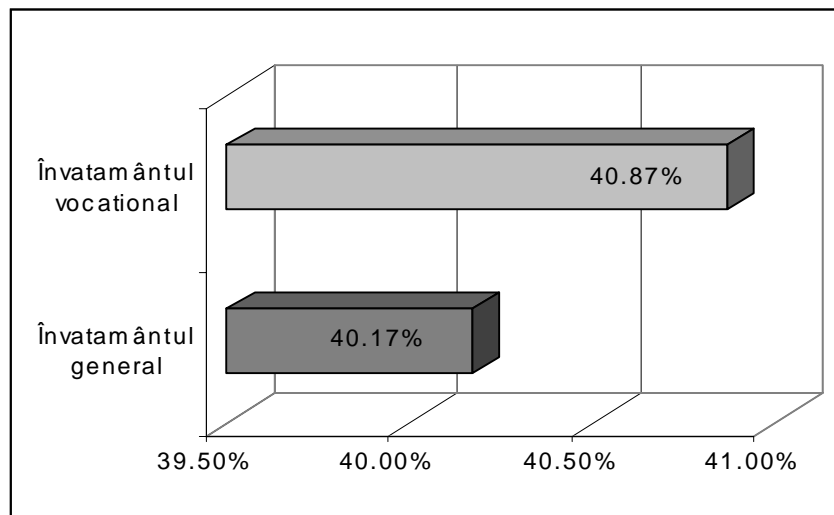
- Psychological indicators [1,3,7].
  - group psychological tests: Pieron, Kraepelin, Praga
- Questionnaires

- investigation of the tiredness phenomenon
- muscle and joints pain with different localizations depending on the instrument [6].
- the number of hours of learning, outside the curricula necessary for participating in an concert

After analyzing the indicators for the neuro – psycho – sensorial tiredness mentioned above, no significant differences were found between teachers (Figure 1) and students (Figure 2) from gymnasium [3] and vocational school.



**Figure 1. Comparison of neuro – psychic stress for teachers from gymnasium and vocational school**



**Figure 2. Comparison of neuro – psychic stress for students from gymnasium and vocational school**

That is the reason why as follows I will refer to special issues encountered at the

vocational school, using the following investigations:

- questionnaires for the investigation of muscle – skeletal
- clinical examination
- noise determinations
- audiometric investigations

## RESULTS AND DISCUSSIONS

The activities that assume a bigger physical effort are being realized with muscle contractions more or less intense during a significant period of the working time.

This effort is sustained by muscle fibers attached to the bones and joints in order to keep the position for as long as the working position is required and to execute the flexion, extension, pronation, supination, rotation necessary for the professional gestures [6].

The variables of the work process can be considered: prolonged un-physiological posture, prolonged static muscular contraction, or persistent contacts of the joints, the gestures with high amplitude, vessels and nerves with rigid surfaces – can lead to musculo-skeletal dysfunctions.

The variables of the work environment can be the parameters that determine the appearance of discomfort: extreme temperatures, high relative humidity, noise discomfort.

The bone-joint and muscle effort is performed for professional activities and for keeping the working position and is variable depending on the working process and work ambiance.

After gathering the data from the questionnaires applied to the teachers and students the following localizations of the pain were revealed:

- chords instruments players:

- upper level of the spine (cervical and thoracic) – 7 teachers (58,33%) and 10 students(45,45%)
- scapula – humeral joint: 5 teachers (41,6%) and 7 (31,81%) students
- interfalanx joints: 3 teachers (25%) and 5 students (22,72%)

- woodwind instrument players:

- cervical spine - 2 teachers (20%) and 3 students (15%)
- elbow joint – 1 teacher (10%); no student
- fist/hand joint - 2 teachers (20%) and 1 student (5%)

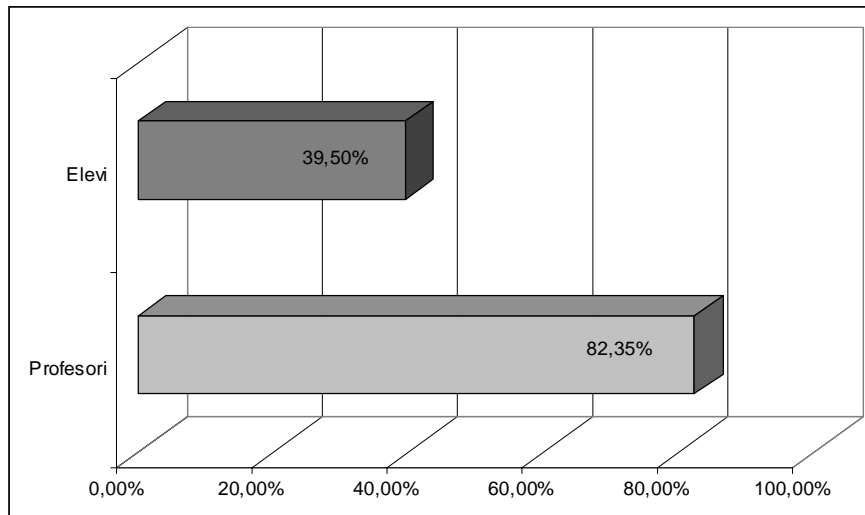
- piano players:

- dorsal-lumbar spine - 4 teachers (40%) and 3 students (12,5%)
- fist joint – 2 teachers (20%) and 1 student (4,16%)
- interfalanx joints 1 teacher (10%); no student

- percussion instruments players:

- elbow joint – no teacher; no student
- fist joint – 1 teacher (50%) and 2 students (20%)

Comparing the percentage of the teachers (82,35%) and students (39,50%) who are complaining of dysfunction of the osteoarticular system a high incidence can be seen for the teachers group (Figure 3).



**Figure 3. The percentage of complains in the bone and joints system**

The clinical examination revealed:

- spontaneous pain and at percussion of the spine with different localizations depending on the instrument for teachers and for students;
- transitory functional dysfunctions at the humeral joint (chords instruments players, percussion instruments players), the elbow joint (woodwind instrument players, percussion instruments players), the fist joint (piano players, chords instruments players, percussion instruments players), the interfalnx joints (piano players and chords instruments players)
- hydrostatic varix in feet, especially in chords

- instruments players – the teachers
- enlarged diameter of the thorax for woodwind instrument players – the teachers

Investigations were made regarding the appreciation of the acoustic working environment by measuring the level of the sound with the integrator Sound meter NL – 21. Instantaneous determinations and the spectral analysis of the sound were performed.

The results of the noise determination during a rehearsal of the orchestra showed the overcome of the maximum allowed level of noise ( $Leq\text{ dB (A)} = 75$ ), in all the measuring points (Table 1).

**Table 1. The results of the noise determination during a rehearsal of the orchestra**

The frequency in Hz	Central stage conductor's level	Desk I Violin	Desk II viola	Desk I violoncello	Desk II violoncello
$Leq\text{ dB(A)}$	109	100	107	88	94
L max	113	102	110	92	98
31,5	94	88	92	86	88
63	102	100	107	91	95



125	97	96	100	89	89
250	92	94	91	83	81
500	87	88	82	80	78
1000	80	81	75	78	75
2000	73	71	69	71	70
4000	71	67	67	69	67
8000	69	65	66	66	65

Legend:

- Leq dB(A) –acoustic equivalent continuous level on the daily exposure on noise
- L max – instantaneous maximal value

The results of the audio test showed:

- in teachers:
  - the existence of one hypoacoustic patient whose distinctive characteristics – bilateral, symmetric, perception type – suggests an occupational cause (violinist with 23 years of work)
  - hearing scotomas in 7 cases
  - the reducing of hearing unilateral acuity in 3 cases
  - acoustic tiredness in 2 cases
- in students:
  - no audio test modifications

## CONCLUSIONS

- Any activity, from any field can become in certain conditions a disturbing factor of health
- Even pleasant occupations as music, can be solicit different parts of the body or the whole body
- When the quality, quantity or the modification of some factors work related, or the environment are changing the health status can be affected
- The teachers are having the subjective symptoms from the muscle and joints and the hearing and the time spent performing this work has an important role.

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# CHRONIC HEPATITIS C VIRUS AND DIABETES CORRELATIONS BETWEEN LABORATORY AND MORPHOPATHOLOGY

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## REZUMAT

*În hepatita cronică cu virus C, se cunosc modificări ale metabolismului glucozei în cadrul diabetului zaharat, prin scăderea toleranței la glucoză pe de o parte, iar pe de altă parte prin afectarea secreției/eliberării de insulină la nivelul celulei Langerhans pancreatice, și modificări ale structurii receptorilor periferici de insulină. Scopul acestei lucrări este de a semnala modificările de laborator și pe cele morfopatologice la pacienții diagnosticați cu hepatită cronică datorită virusului hepatitic C și diabet zaharat, comparativ cu pacienții diagnosticați cu hepatită cronică datorită virusului hepatitic C fără diabet zaharat. În urma analizei datelor studiului propriu, în concordanță cu datele din literatură, am observat că în hepatita cronică cu virus C, asociată cu diabetul zaharat, analizele și leziunile hepatice sunt mult mai severe decât în absența acestuia, în special valorile alanin și aspartat aminotransferazei, alături de leziunile de necroză periportală și intralobulară.*

**Cuvinte cheie:** hepatită cronică cu virus C, genom, alanin și aspartat aminotransferază, diabet zaharat, necroză

## ABSTRACT

*Patients with hepatitis C virus experience disorders of glucose metabolism in diabetes, by decreasing the glucose tolerance on one side, and on the other hand by affecting the insulin secretion/release at the Langerhans pancreatic cell level, and by variations of the insulin peripheral receptors' structure. The purpose of the present paper is to identify the laboratory and morphopathological changes at the patients diagnosed with chronic hepatitis C virus and diabetes in comparison to the patients with chronic hepatitis C virus without diabetes. Following the data analysis from the present study, and on the basis of the specialty literature information, we have noticed that in chronic hepatitis C virus with diabetes, the hepatic analysis and lesions are more severe than in the chronic hepatitis C virus without diabetes, especially the alanine and aspartate aminotransferase values together with the periportal and interlobular necrotic lesions.*

**Keywords:** *chronic hepatitis with C virus, genome, alanine and aspartate aminotransferase, diabetes, necrosis*

## INTRODUCTION

The hepatitis C virus (HCV) is the major cause of chronic hepatitis, hepatic cirrhosis and hepatocellular carcinoma on an international level [1,2]. From the taxonomic point of view, HCV belongs to the Hepacivirus gender from the Flaviridae Family; it has a spherical shape, dimensions quite small (40-60 nm) and is an ARN virus. After the infection has started, the virus suffers mutations and creates different genetic varieties leading to the appearance of definite species – viral versions that differ at the genome level from the original matrix and that coexist with this in a hepatitis C individual. There is also the risk that the infected person shall cure from the hepatitis C which is provoked by a certain genotype, but the disease shall persist due to a reinfection with any other HCV genotypes [3,4,5,6].

From the structural point of view, the virus resembles with most of the complex viruses and contains (ARN) genetic material protected by a protean structure, together forming the Nucleocapside, plus a cover rich in lipids [7,8]. The Capsid has a spherical shape and presents an

In this clinical study, we consider the premises according to which the HCV infection precedes the development of the diabetes (D.Z) [17,18]; the mechanism being unknown yet, but we can mention a series of determining factors:

- The presence of the proinflammatory and inflammatory cytokines
- The indirect action through autoantibodies on the pancreatic cell
- The direct cytotoxic action of the HVC on the pancreatic cell

undistinguished symmetry being made of the C (core) structural protein, and the Cover is formed of two structural glycoproteins E1 and E2 (group 31 and group 70). Next to these three types of structural proteins we also find four non-structural proteins (NS2-NS5) with an important role in diagnosing the hepatic virus variability [9,10].

Alongside the HCV hepatic manifestations we encounter extra hepatic manifestations as well, such as fixing the virus to the CD81 receptor of the B lymphocyte through the E1 structural protean. Fixing the virus to the B lymphocyte together with its own mutagen features helps the virus to escape from the action of the immunological mechanisms by establishing the infection persistence and the continuous stimulation of the B and T lymphocytes [11,12,13].

The specialty literature mentions the modifications of the glucose metabolism in the diabetes [14,15,16] by decreasing the tolerance for glucose on one hand and on the other hand by affecting the secretion/release of insulin at the Langerhans pancreatic cell level, and variations of the insulin peripheral receptors' structure.

By its proteins, HCV can establish a distortion of the insulin signal and thus to induce the insulin resistance [19,20].

## PURPOSE

The purpose of this paper is to underline the modifications of the laboratory and morphopathological analyses at the patients diagnosed with chronic hepatitis C virus and diabetes in comparison to the patients with chronic hepatitis C virus without diabetes.

## OBJECTIVES

This paper has the following objective:

- Interpreting the results of the laboratory analyses and the morphopathological modifications at the patients with chronic hepatitis C virus and diabetes.
- Interpreting the results of the laboratory analyses and the morphopathological modifications at the patients with chronic hepatitis C virus without diabetes.

## MATERIAL AND METHOD

The research is retrospective and descriptive due to the analyses of the data base of the Gastroenterology department and of the medical analyses Laboratory within the County Hospital from Timișoara during the period 2005-2006. The presence of the diabetes has been underlined with the help of fasting glycemia in two different days with values  $\geq 126$ mg/dl or with the help of postprandial glycemia  $\geq 200$  mg/dl, while the laboratory diagnosis of the chronic hepatitis C virus has been assessed with the help of certain biological and serological markers (Table 1).

**Table 1. The evolution of the biologic and serologic markers in the HCV infection**

Markers	The preferred detection technique	The appearance period (weeks)	Behavior			
			Prodrom	Acute	Chronic	Healing
ALT	Immuno enzymatic	5-12	N	↑↑↑	↑	N
ARN VHC	PCR	1-2	++	++	++	+/-
Anti-c22	EIA/RIBA	7-12	-	-/+	++	+
Anti-E1	EIA		-	-	-	+
Anti-E2	EIA		-	-/+	+/-	-
Anti-c33	EIA/RIBA	> 2	-	-/+	+	-
Anti-c100	EIA/RIBA	10-15	-	- -/+	+/-	-

We have taken into account two groups of patients:

**Group 1** being formed of 23 patients with chronic hepatitis C virus and diabetes with the age between 40-65 years old (an average of 55 years), among which 18 women and 5 men; the diabetes is represented by type 1 diabetes at one patient and type 2 at 22 patients. Three of these patients are obese and the rest of 19 have normal weight considering their diabetes. Nine of these patients from the total of 22 suffer of diabetes with an insulin need, and 13 are under oral antibiotics treatment and diet.

**Group 2** is formed of 28 patients with chronic hepatitis C virus, without diabetes, with the age between 40-65 years old (an average of 53 years), among which 14 are women and 14 men.

## RESULTS AND DISCUSSIONS

In the group of patients with chronic hepatitis C virus and diabetes we have noticed the following modifications of the laboratory analyses (1) and the Knodell score (2):

### 1. Laboratory analyses

- The alanine and the aspartate aminotransferase level (AST and ALT) has increased up to 20 times compared to the upper limit of the normal at 20 patients from the total of 23 studied (85%).
- The alkaline phosphatase (FAL) and the gamaglutamatttransferase values (Gama GT) have been normal to all the studied patients.
- The albumin and the prothrombin time level have been normal, except 4 patients in an advanced stage of disease to which we have found an

increased value compared to normal (17%).

- The Fe<sup>+</sup> and the Ferritin level has been found high in 8 patients, representing 33% from the total studied patients (Figure 1).

### 2. Knodell score

- An average score of 5 of the periportal necrosis has been found to most of the cases (95%) with a score  $\geq 3$ .
- The interlobular necrosis presence in an average score of 5 has been encountered in over 69% of the cases with a score of  $\geq 2$ .
- The portal inflammation presence with an average score of 2.6; (score  $\geq 3$  at 56% of the patients)
- The fibrosis presence with an average score of 1.6; 69% of the patients having a score of 1.26, 26.6% of them having the score 3, 4% of them having the score 4 and 1% having the score 0 (Table 2).

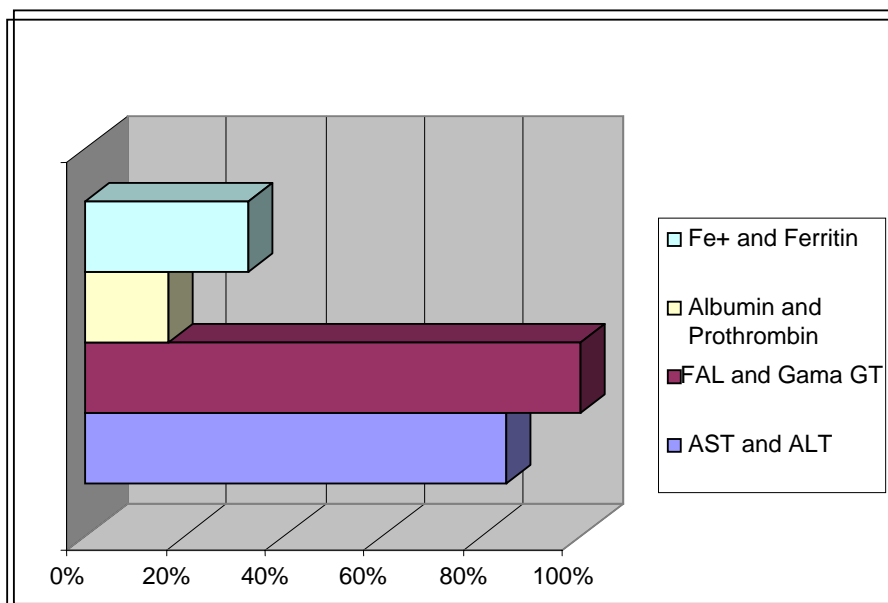


Figure 1. Patients with HCV and diabetes – Laboratory analyses

Table 2. The anathomopathology study results

No	CHRONIC HEPATITIS C VIRUS AND DIABETES				CHRONIC HEPATITIS C VIRUS			
	N	L	I	F	N	L	I	F
1.	4	3	2	1	1	1	1	0
2.	3	3	1	1	1	2	3	1
3.	5	1	2	1	5	1	3	1
4.	5	1	3	2	3	1	3	1
5.	1	3	1	0	1	3	1	1
6.	6	4	3	3	4	1	4	1
7.	6	4	4	3	3	1	3	1
8.	4	4	3	3	3	1	3	1
9.	5	1	3	3	3	1	3	1
10.	6	1	4	3	10	3	3	4
11.	6	1	3	2	1	1	1	0
12.	3	1	3	0	1	1	1	0
13.	5	3	3	3	4	1	3	1
14.	5	1	3	1	1	1	3	0
15.	6	3	3	1	1	1	0	0
16.	8	3	2	1	5	3	3	0
17.	3	3	3	1	3	1	3	1
18.	3	2	1	1	5	1	4	1
19.	6	3	3	4	6	1	3	3
20.	5	2	1	1	5	1	3	1
21.	4	3	3	1	5	1	3	3
22.	5	2	2	1	3	1	3	4
23.	4	3	3	1	1	1	1	0
24.					3	1	3	1
25.					1	1	3	1
26.					1	1	3	1
27.					5	1	3	1
28.					1	1	3	1
<b>AVERAGE</b>	5	2,6	2,5	1,6	3	1,2	2,5	1,1

In the group of the patients that suffered from chronic hepatitis C virus without diabetes, we have noticed the following:

#### 1. Laboratory analyses

- The alanine and aspartate aminotransferase level (AST and ALT) has increased up to 15 times compared to the upper limit of the normal in 13 patients from the total of 28 studied patients (45%).

- The iron and ferritin level has increased in 3 patients, who represent 12% from the total of patients studied (Figure 2).

#### 2. Knodell score

- The periportal necrosis has an average score of 3; 39% from the patients have the score 1 and 60% have the score 3.
- The interlobular necrosis has an average value of 1.2; 85% from the

- patients having a score of 1 and 15% of them having a score bigger than 2.
- The portal inflammation with an average score of 2.5; 71% from the patients having a score of 3, 12% of them having a score of 4 and 17% of them having a score of 1.
  - The fibrosis has an average score of 1 in 57% from the patients, 25% having 0 fibrosis, 11% of them having 3 fibrosis and 7% - 4 fibrosis (Table 2).

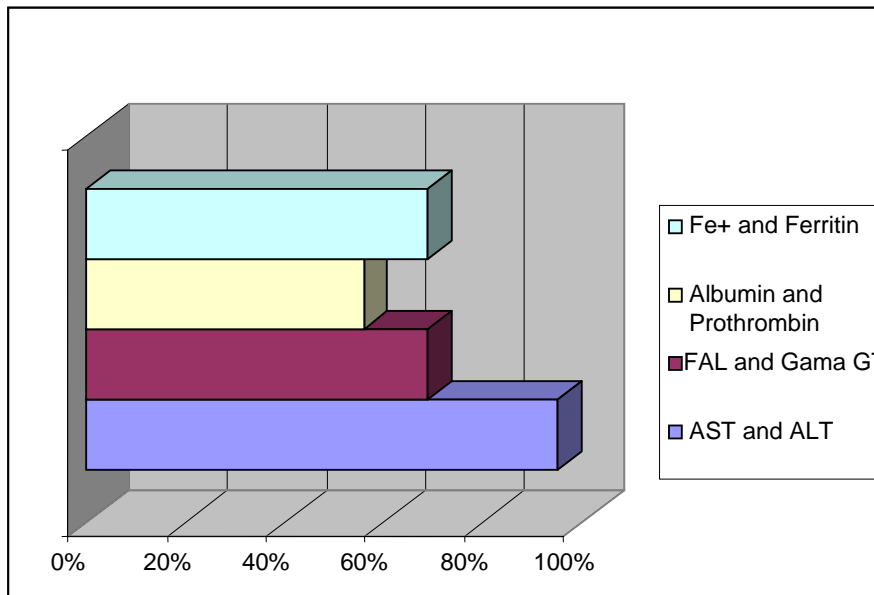


Figure 2. Patients with HCV – Laboratory analyses

## CONCLUSIONS

From the conducted research we have retain the following conclusions:

Laboratory analyses:

- The ALT and AST levels have increased in patients from group 1 compared to those from group 2
- FAL and GAMA-GT have been normal in both groups
- The albumin and the prothrombin have increased in 4 patients from group 1 due to the advanced stage of the disease.
- The Fe+ and the Ferritin have increased in patients from group 1 (33%) compared to those from group 2 (12%)

Anathomopathology analyses:

- The patients with chronic hepatitis C virus and diabetes showed lesions of periportal necrosis more severe than those without diabetes (average of 5 compared to 3)
- The interlobular necrosis is severe to the patients from group 1 compared to those from the second group, in which it is moderate (the average being 2.6 compared to 1.2)
- We haven't noticed differences regarding the portal inflammation lesions in any group (the average being 2.5)
- The fibrosis was present in both groups with a slightly increase in group 2 compared to group 1, the average value being 1.1



Following the information analysis of the personal study as well as those from the specialty literature, we have noticed that in the chronic hepatitis C virus associated with diabetes the lesions are more severe than those in the absence of diabetes. These lesions are expressed predominantly as periportal, lobular and interlobular necrosis, due to the diabetes association with dyslipidemia and hepatic steatosis as a cause of the insulin resistance, which is a factor that initiates necrosis and fibrosis.

Taking into account the fact that hepatitis C is considered a „disease”, huge steps have been made in finding new remedies for curing the disease; but meanwhile we must continue to live hoping that these are being found. The only conditions that make hepatitis a “disease” that can extend on decades is avoiding the alcohol consumption and excessive fats.

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# THE ROLE OF CIRCULATION'S SECURITY DORMITORY FOR THE RECOVERY OF ENGINE MECHANICS AND OFFICIALS

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## REZUMAT

*Siguranța circulației este termenul generic pentru o activitate importantă în deplasarea materialului rulant. Personalul implicat în desfășurarea acestei activități reprezintă o categorie profesională cu mare responsabilitate. De capacitatea de reacție a acestora depinde viața pasagerilor și păstrarea integrității materialului rulant. Odihna și capacitatea profesională sunt factorii cheie în calitatea muncii lor, efectuată în schimburi de zi și de noapte. S-au studiat 86 de persoane care utilizează 8 dormitoare de siguranța circulației (mecanici de locomotive, impiegati de mișcare). S-a analizat gradul de oboseală după schimb la intrarea în dormitor (76,74% dintre persoane sunt obosite). După perioada petrecută în dormitor, 20,94% acuză aceeași stare de oboseală. S-a dovedit existența unei corelații semnificative statistic între starea la intrare și la ieșirea din dormitor și numărul de ore petrecute în dormitorul de siguranța circulației*

**Cuvinte cheie :** siguranța circulației, dormitor de siguranța circulației, odihnă

## ABSTRACT

*The circulation's security is a general concept for an important activity: rolling stocks maneuvering. The hired employees in this activity have a great responsibility. Their capacity of reaction could keep rolling stocks' integrity and even save passenger's lives. So, the key factors in their day/night shift work quality are the rest they get and their reaction capacity. The study included 86 subjects, users of 8 circulation's security dormitories (engine mechanics, train conductors). The tiredness degree was computed after shift, at the dormitory's entrance (76.75 % tired subjects). Following the period past in the dormitory, 20.94 % still claim tiredness. The correlation between the degree of repose status in and out of the dormitory, and also the time past in, was statistically significant.*

**Keywords:** circulation's security, circulation's security dormitory, repose

## INTRODUCTION

The health and work conditions are strongly related, due to some work conditions particularities. Circulation's security of transport is a concept implying that the railroad transportation and the maneuvering of rolling stocks are not dangerous for travelers and goods, rolling stocks, infrastructure and environment [1].

The railroad transportation is still the most popular way of transport and for this reason the employs travel long distances. Dormitory of circulation's security are built for the rest and the recovery of this workers, like the hotels system of civilian services [2, 3], including psycho-sensitive recovery [4].

## MATERIAL AND METHOD

In this study eight dormitories in The Bucharest Railroad Regional were screened: Ploiești(1), Bucharest(2), Basarab(3), Obor(4), Târgoviște(5), Grivița(6), Videle(7), Giurgiu( 8).

The buildings structure showed a non uniform room structure: large dormitories (over 7 rooms) and small dormitories. The profession is also involved in habitation of these dormitories: the engine mechanics are divided in Ploiești Depot, Bucharest Depot, Basarab, Obor, and in the others are both engine mechanics and conductors. The male /female structure follows the same distribution: only men in the first four dormitories we named, and mixed on the others.

The study included 86 persons (41 engine mechanics and 45 conductors). The number of subjects was quite similar, but the distributions on sexes marked out the conductors were males and females (70% males) and the engine mechanics were only men. Average professional seniority was between 14-17 years.

The tiredness after work and its determinant factors were studied with the help of a questionnaire (Annex 1).

### Annex 1. Questionnaire on the circulation's security for the personnel

1. First name, last name (first point).....
2. Age.....sex.....height(cm).....weight(kg).....
3. Profession.....Average professional seniority (years).....
4. After how many work hours you arrived to the dormitory?
  - 8 hours
  - 12 hours
  - >12 hours
5. How are you feeling after work?
  - very tired
  - tired
  - not tired
6. At what interval do you change the shift (day/night)?
  - daily
  - weekly
  - monthly
  - incidental
7. Are you alone at work?
  - Yes
  - No
8. After how many work hours are you tired?
  - 5 hours
  - 5-8 hours

- >8 hours
9. Are you more tired after on night shift or after on day shift?  
 - on night  - on day
10. How many hours do you rest in the dormitory?  
 -3 hours  
 -3-6 hours  
 -6-8 hours  
 ->8 hours
11. How rested are you after repose in the dormitory?  
 - rested  
 - rather rested  
 - tired  
 - rather tired  
 - more tired than the beginning of repose

## RESULTS AND DISCUSSIONS

The tiredness affects all subjects in various degrees, mostly after 8 hours of work. This

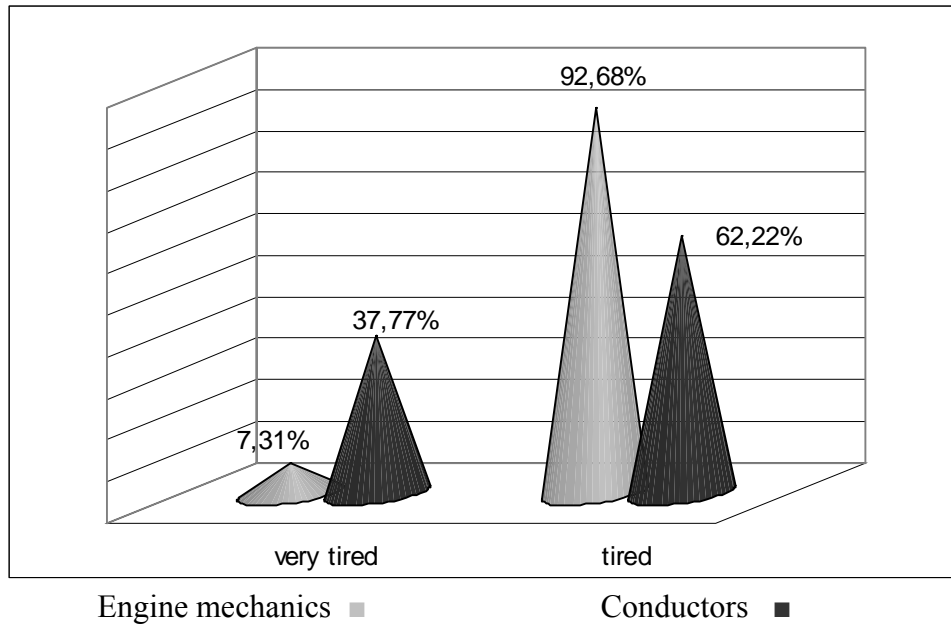
is statistically significant for the 31-50 years cohort ( $p < 0.05$ ) (Table 1).

**Table1. Workers distribution by the number of work hours**

Cohort	8 hours	12 hours	>12 hours
Engine mechanics (41)	13 (31.7%)	26 (63.41%)	2 (4.87%)
Conductors (45)	19 (42.22%)	23 (54.11%)	3 (6.66%)

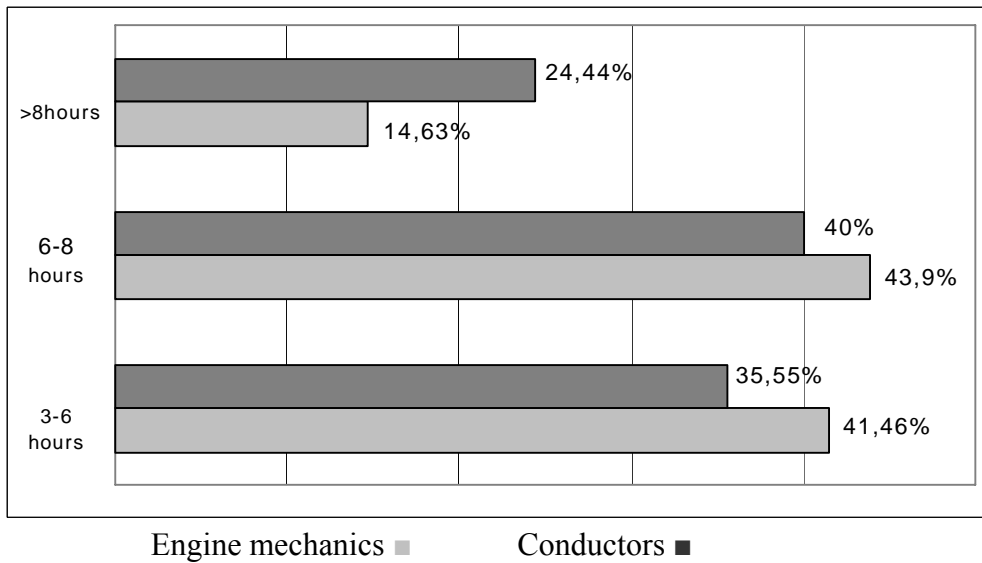
Weekly and incidentally shift change affects mostly the conductors group (nonevent). Incidental shift change and night shift affects the engine mechanics group and both are statistically significant ( $p < 0.5$ ).

The conductors declared they are very tired in high percent (37.77%), while the engine mechanics declared the same thing only in percent of 7.31%. From the 2 groups together, 66 persons (76.74%) claim to be tired after work and 23.25% claim to be very tired after work (Figure 1).



**Figure 1. Tiredness at the entrance in the dormitory**

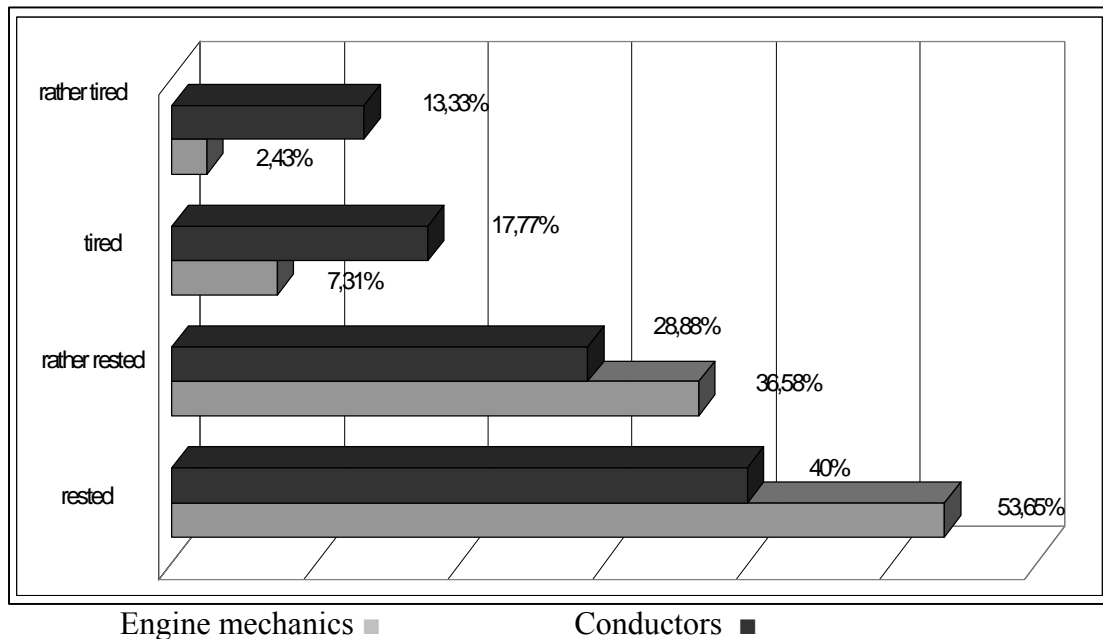
The average time past in the dormitory vary between: at least 3 hours and over 8 hours; 80.23% of all subjects rest 3-8 hours (Figure 2).



**Figure 2. Subject's distribution related to the time past in the dormitory**

68 from the 86 persons using the dormitory (79.06%), who claim to be rested and rather rested when they leave the dormitory, claim to have a good recovery ( $p < 0.5$ ). Only 11 persons (12.79%) leave the dormitory and are still tired. The tiredness at the arrival in

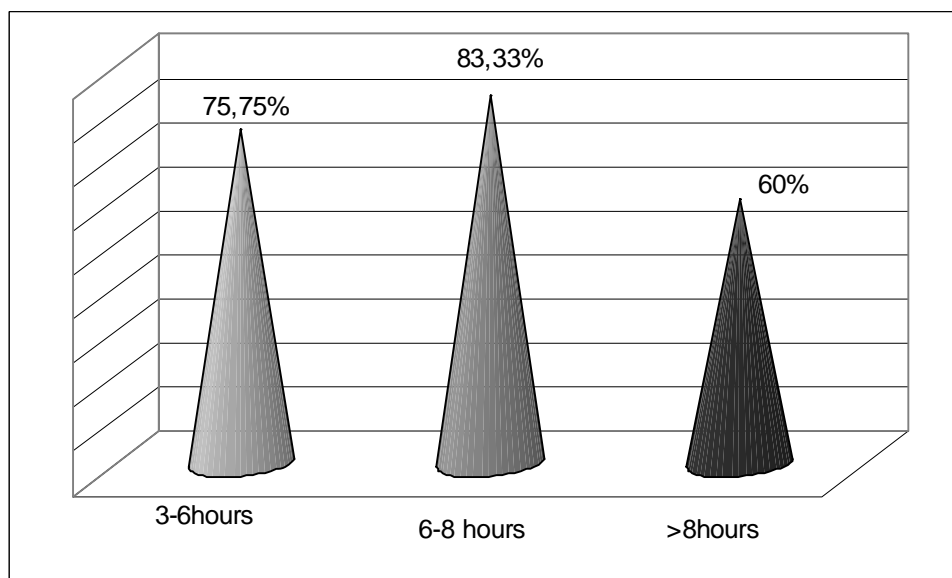
the dormitory versus the tiredness when leaving it is statistically significant ( $p < 0.5$ ), and also the correlation between the time spend in the dormitory and how reposed they feel when leaving it ( $p < 0.5$ ) (Figure 3).



**Figure 3. How reposed people feel when leaving the dormitory**

The correlation between the time spend in the dormitory and how well the people rested showed:

- 33 persons (17 engine mechanics and 16 conductors) rested 3-6 hours; from them 75.75% are rested or rather rested
- 36 persons (18 from each category) rested 6-8 hours; from them 83.33% are rested or rather rested ( $p=0,1$ )
- 20 persons (6 engine mechanics and 4 conductors) rested for more then 8 hours; from them 60% are rested or rather rested.



**Figure 4. The rest status correlated wit the time spend in the dormitory**

The group who rested for 6-8 hours is the most numerous (36 persons) and the most rested too (83.33%) (Figure 4).

All groups (over 75%) mentioned that the night sleep is better than the day sleep, no matter where ( $p=0.5$ ).

The correlation between the time the person slept, and the time the tiredness appears is statistically significant too ( $p=0.5$ ).

### CONCLUSIONS

1. The circulation's security dormitories are spaces permanently in use.

2. The circulation's security dormitory is needed for railroad employees because they travel long distances.

3. The habitation needs separate rooms with only 1-2 beds.

4. The dormitories need better subdivision and renewal with phonic and heat installations, so they can provide optimal sleeping conditions permanently (24 hours).

5. For a normal professional activity, the railroads workers need to sleep at least 8 hours.

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# THE ROLE OF EMPIRICAL ANTIBIOTHERAPY IN MANAGING MULTIRESISTANT ENTEROBACTERIACEAE STRAIN INFECTIONS

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## REZUMAT

**Obiective.** Studiul și-a propus investigarea potențialului antibioterapiei empirice, administrată în primele 48 de ore de la debutul infecțiilor cu tulpini de Enterobacteriaceae multirezistente, în influențarea prognosticului evolutiv al cazurilor. **Material și metodă.** S-au analizat 2 eșantioane identice ca mărime și similare din punct de vedere demografic/clinic, ale căror subiecți au dezvoltat, pe parcursul internării în Departamentul ATI, infecții cu tulpini de Enterobacteriaceae, diferite din punct de vedere al fenotipurilor de rezistență. **Rezultate.** Atât numărul mediu de antibiotice per pacient, cât și numărul de zile de antibioterapie au fost semnificativ statistic crescute în rândul subiecților infectați cu tulpini multirezistente ( $p=0,003$ , respectiv  $p=0,001$ ). Antibioterapia empirică ineficace, administrată în primele 48 de ore, s-a dovedit un important factor de risc pentru mortalitate, în rândul acestor subiecți - OR=4,46 (1,69-11,98), RR=1,84 (1,20-2,81). **Concluzii.** Impactul substanțial al antibioterapiei inițiale obligă la cunoașterea florei microbiene circulante și a fenotipurilor de rezistență, pentru maximizarea șanselor terapeutice.

**Cuvinte cheie:** Enterobacteriaceae, multirezistență, antibioterapie, infecții nosocomiale

## ABSTRACT

**Objectifs.** The present study hold forth investigating the potential of empirical antibiotherapy, if administered in the first 48 hours since the debut of multiresistant Enterobacteriaceae strains infections, to influence the case evolution prognosis. **Material and method.** Two samples, of identical proportions and demographically/clinically similar, composed of subjects which developed, during their period of internment on the Intensive



Care Unit, Enterobacteriaceae strains infections, with different resistance phenotypes. **Results.** Both the medium number of antibiotics on patient and the number of days of antibiotherapy were statistically significant increased among subjects infected with multiresistant strains ( $p=0.003$ , respectively  $p=0.001$ ). The inefficient empiric antibiotherapy, administered in the first 48 hours, proved to be an important risk factor for mortality among this subjects – OR=4.46 (1.69 – 11.98), RR=1.84 (1.20 – 2.81). **Conclusions.** The substantial impact of the primary antibiotherapy calls upon the knowledge of circulating microbial flora and the resistant phenotypes, in order to maximize the therapeutic chances.

**Keywords:** Enterobacteriaceae, multiresistant, antibiotherapy, nosocomial infections.

## INTRODUCTION

The growing prevalence of multiresistant bacterial strains inevitably leads to a higher risk of inappropriate antibiotherapy, defined as the use of an inefficient treatment for the microbiologically documented infection. In practice, broad-spectrum antibiotics are administered in the first 48 hours following the sampling of the pathological product, after advancing a presumptive infectious diagnosis and before receiving the microbiological result, including the sensitiveness of the bacterial strain. The decision regarding this empirical therapy must take into account the patient's history, possible resistance risk factors, the likeliest pathogen, as well as the circulating phenotypes in the medical unit in the case of nosocomial infections. In the latter case, many studies show that over 20% of the patients are given an inefficient antibiotherapy for different kinds of infections [1,2]. The present study set out to investigate the potential of empirical antibiotherapy, administered in the first 48 hours after the onset of severe multiresistant Enterobacteriaceae strain infections, to influence the case evolution prognosis.

## MATERIAL AND METHOD

An analytical study was set up for 2 groups of inpatients from September 1, 2005 to September 1, 2007, in the Intensive Care Unit at the County Emergency Clinical Hospital in Timișoara, which is the largest Intensive Care Unit (ICU) providing tertiary care to the population in the western part of Romania. Each group included 100 patients

infected with Enterobacteriaceae strains – one group infected with predominantly sensitive strains, possibly resistant to  $\leq 2$  classes of antibacterial agents, and the other group consisting just of cases infected with multiresistant Enterobacteriaceae strains, displaying resistance to more than 3 classes of antibacterial preparations [3]. The criteria for the inclusion in Group 1 focused on patients who developed a nosocomial infectious pathology 48 hours following hospitalization in the ICU, and from whom positive cultures of sensitive Enterobacteriaceae strains were obtained. Group 2 contained the patients hospitalized during the same period, with similar demographic and pathological items, who developed nosocomial infections with bacterial strains from the same family, but of the multiresistant type. Where several species of enterobacteria were isolated, at least one of them displayed the multiresistant phenotype, otherwise the patient was included in the sensitive group.

The study excluded patients who had nosocomial infections prior to being hospitalized in the ICU (in other departments or other tertiary medical units), those with community pathology, those that displayed similar symptoms with the start of infection when they were hospitalized or those infected only with bacterial strains belonging to other genera than those included in Enterobacteriaceae. Group 1 excluded patients whose etiologic bacterial spectrum contained Enterobacteriaceae strains or association germs with

multiple resistance (methicillin-resistant *Staphylococcus aureus*, vancomycin-resistant *Enterococcus*, non fermentative gram-negative germs secreting extended spectrum  $\beta$ -lactamase). Group 2 excluded patients infected with strain associations

belonging to different multiresistant bacterial genera. All subjects were included once and the selection criteria were the same for all patients in each group. Table 1 gives a summary of the demographic characteristics of the groups.

**Table1. Demographic and clinical characteristics of the two groups**

	<b>Group 1 (N=100)  No multiresistance</b>	<b>95%IC</b>	<b>Group 2 (N=100)  Multiresistant</b>	<b>95%IC</b>	<b>p</b>
Mean age	55.47 years	51.94-59.0	55.32 years	51.89-58.75	0.59
Median	58 years	-	57.5	-	-
Minimum age	18years	-	18 years	-	-
Maximum age	85 years	-	83 years	-	-
Gender: F	43% (n=43)	33.1-53.3%	33 % (n=33)	23.9-43.1%	0.14
Gender: M	57% (n=57)	46.7-66.9%	67% (n=67)	56.9-76.1%	0.14
Medical pathology patient	32% (n=32)	23.0-42.1%	43% (n=43)	33.1-53.3%	0.10
Surgical pathology patient	52% (n=52)	41.8-62.1%	45%(n=45)	35.0-55.3%	0.32
Polytraumatic patient	16% (n=16)	9.4-24.7%	12% (n=12)	6.4-20.0%	0.41

The inclusion within the nosocomial criteria was performed in compliance with the Order of the Minister of Health no 916/July 27 2006 [4]. The starting date of the infection was considered the day when the clinical symptomatology made it necessary to request a microbiological investigation that led to the identification of the Enterobacteriaceae strain and compelled the clinician to start some antibiotherapy.

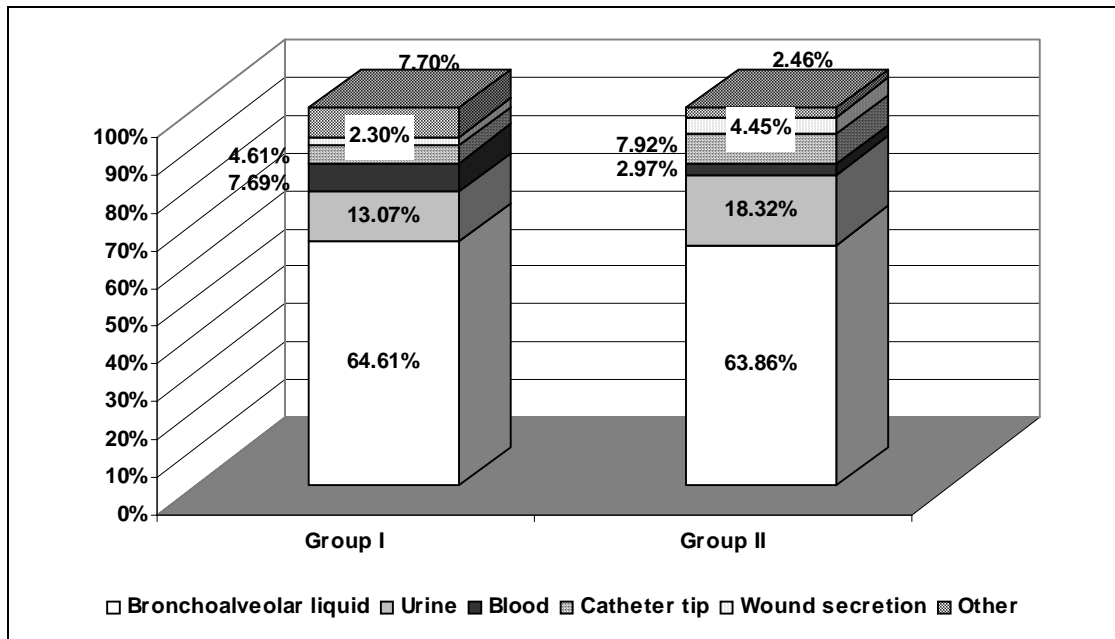
Antibiotic consumption was quantified, strictly for the ICU hospitalization period, in DDD (Defined Daily Dose)/1,000 patient-days (pd), in compliance with the methodology established by the WHO

Collaborating Centre for Drugs Statistics Methodology [5,6].

To identify the bacterial strains, products sampled in the usual activity of the ICU were used, with isolation on a nonselective medium (agar Columbia with 5% ram blood) and on a selective medium (lactose MacConkey medium). After insemination and incubation for 24 h at 37°C, the identification was performed using API ID 20 E manual galleries (BioMérieux), and sensitivity to antibacterial agents was determined using the Kirby-Bauer antibiotic testing on a Mueller-Hinton medium, with a standardized inoculum of 0.5 McFarland, in

compliance with the CLSI (Clinical and Laboratory Standards Institute) norms [7].

130 pathological products sampled from Group 1 and 202 pathological products sampled from Group 2 were processed, distributed as shown in Figure 1.



**Figure 1. Distribution of the pathological products from which the Enterobacteriaceae strains were isolated**

The EpiInfo program (version 3.2.2, April 2004) was used for the statistical processing. The two groups were compared using the independent t-test for continuous numerical variables characterized by a mean, with a Gaussian distribution, and the Mann-Whitney non-parametric test for the variables displaying an abnormal distribution. The dichotomous variables, characterized by percentage, were compared using the hi2 test. All statistical tests were

calculated with 2 tails and the p value was considered statistically significant  $\leq 0.05$ .

**RESULTS**

447 bacterial strains were isolated from the 200 subjects included in the study, with no significant statistical differences regarding the species/genus distribution in the two groups, as shown in Table 2.

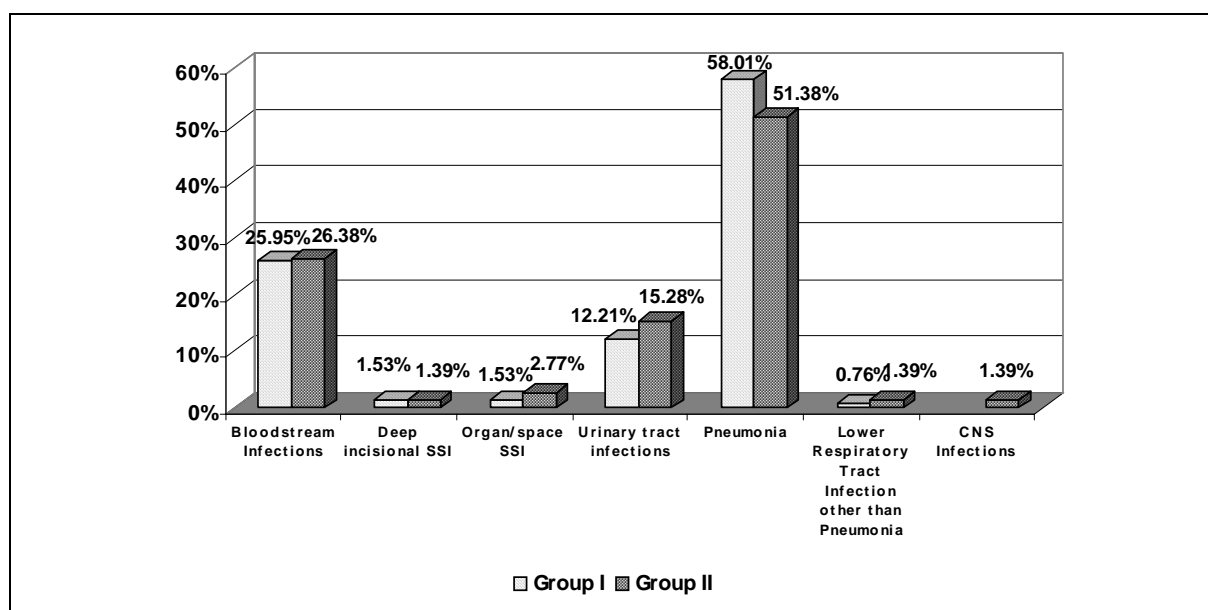
**Table 2. Distribution of the bacterial strains**

Genus/Species	Group 1		Group 2		p
	n1	%	n2	%	
<b>Enterobacteriaceae</b>					
<i>Citrobacter freundii</i>	-	-	1	0,38	1
<i>E.coli</i>	35	18,82	45	17,24	0,66
<i>Klebsiella sp.</i>	47	25,27	53	20,31	0,21
<i>Klebsiella pneumoniae</i>	27	14,51	52	19,92	0,13

<i>Klebsiella oxytoca</i>	1	0,54	1	0,38	1
<i>Enterobacter cloacae</i>	5	2,68	4	1,53	1
<i>Proteus sp.</i>	5	2,68	16	6,13	0,09
<i>Proteus mirabilis</i>	9	4,84	23	8,81	0,10
<i>Proteus penneri</i>	1	0,54	-	-	0,41
<i>Providencia stuartii</i>	1	0,54	1	0,38	1
<i>Providencia rettgeri</i>	/	/	1	0,38	1
<i>Serratia marcescens</i>	3	1,61	6	2,29	0,74
<i>Morganella morganii</i>	-	-	3	1,15	0,26
<b>Associated bacterial strains</b>					
<i>Acinetobacter baumannii</i>	3	1,61	4	1,53	1
<i>Staphylococcus aureus</i>	45	24,19	50	19,16	0,19
<i>Pseudomonas aeruginosa</i>	4	2,15	1	0,38	0,16
<b>TOTAL</b>	<b>186</b>	<b>100</b>	<b>261</b>	<b>100</b>	

The infectious pathology recorded 131 infections versus 144 (some subjects displaying 2 or even 3 distinct types),

according to a similar distribution, illustrated in Figure 2.



Legend: SSI- Surgical Site Infections

**Figure 2. Distribution of the types of Enterobacteriaceae strain infections in the 2 groups**

The administration of the antibacterial chemotherapeutic preparations was monitored comparatively, in terms of both the number of antibiotics administered per

patient and the number of days during which it was administered, working out the results shown in Table 3.

**Table 3. Differences recorded in the antibiotherapy behavior**

	N° of antibiotics given in the ICU			Days of antibiotherapy in the ICU		
	Group 1	Group 2	p	Group 1	Group 2	p
Mean	2.09	3.02	<b>0.003</b>	7.93	14.65	<b>0.001</b>
95% IC	1.74-2.44	2.55-3.49	-	6.47-9.39	11.65-17.65	-
Median	2.00	3.00	-	6.00	9.00	-
Minimum	0.00	0.00	-	0.00	0.00	-
Maximum	8.00	13.00	-	33.00	87.00	-

The antibiotic consumption during the study, strictly for these 200 patients, ranged from 17.39 DDD/1,000 pd in the group infected with sensitive strains to 33.12 DDD/1,000 pd in the group with

multiresistant strains, especially influenced by the increased administration of  $\beta$ -lactams with  $\beta$ -lactamase inhibitor and of carbapenems, as seen in the table below (Tabel 4).

**Table 4. Antibiotherapy preparation consumption**

Antibiotic classes	Group 1	Group 2
	DDD/1,000 pd	
Penicillins	0.69	1.18
Combinations with $\beta$ lactamase inhibitors	3.56	7.18
Cephalosporins – 1 <sup>st</sup> generation	0.164	0.33
Cephalosporins - 2 <sup>nd</sup> generation	-	0.01
Cephalosporins - 3 <sup>rd</sup> generation	1.24	1.65
Cephalosporins - 4 <sup>th</sup> generation	-	0.03
Carbapenems	2.55	7.96
Macrolides	0.05	0.31
Lincosamides	0.12	1.53
Aminoglycosides	1.8	2.53
Fluoroquinolones	3.08	3.67
Imidazole derivatives	0.52	0.44
Glycopeptides	2.27	3.74
Amphenicols	0.675	0.66
Polymyxins	0.56	1.21
Rifamycins	0.11	0.6

Other (Linezolid)	-	0.07
<b>TOTAL</b>	<b>17.39</b>	<b>33.12</b>

To research the importance of first intention antibiotherapy, each group of subjects was divided into those that received efficient treatment within the first 48 hours versus those that did not. The first category included all patients that received an antibiotic that the strain later proved

sensitive to. The second category included the subjects treated with preparations to which the strains were resistant and a few cases where antibiotherapy was delayed until the microbiological result was received. The patients' subsequent evolution varied, as seen in Table 5.

**Table 5. Evolution of the subjects depending on the antibiotherapy received within the first 48h**

	Improved		Static		Worsened		Deceased	
	G 1	G 2	G 1	G 2	G 1	G 2	G 1	G 2
	%(n)	%(n)	%(n)	%(n)	%(n)	%(n)	%(n)	%(n)
With appropriate antibiotherapy in the first 48h	61.36% (n=27)	58.82% (n=20)	0% (n=0)	0% (n=0)	0% (n=0)	0% (n=0)	38.63% (n=17)	41.17% (n=14)
Without appropriate antibiotherapy in the first 48h	39.28% (n=22)	18.18% (n=12)	1.78% (n=1)	1.51% (n=1)	3.57% (n=2)	4.54% (n=3)	55.35% (n=31)	75.75% (n=50)
<b>p</b>	<b>0.02</b>	<b>&lt;0.001</b>	1	1	0.50	0.54	0.09	<b>&lt;0.001</b>

## DISCUSSIONS

The present study followed the differences that arose in the treatment using antibacterial agents on two groups of identical size and with similar demographic/clinical characteristics, whose subjects, while hospitalized in the Intensive Care Unit, developed infections with Enterobacteriaceae strains of different resistance phenotypes. Both the mean number of antibiotics per patient and the number of days of antibiotherapy were significantly higher for the subjects in Group 2 ( $p=0.003$  and  $p=0.001$ ,

respectively). The increase in antibiotic consumption, in this group, was done by increasing the administration of  $\beta$ -lactams with  $\beta$ -lactamase inhibitor and of carbapenems.

No statistically significant differences occurred in the manner of antibiotic prescription within the first 48 hours after the onset of the infection, with 44 patients receiving efficient treatment in the first group versus 34 patients in the second group ( $p=0.147$ ). Nevertheless, statistically significant variations were recorded in the subsequent evolution, depending on whether

or not there was some efficient antibiotherapy administered for Enterobacteriaceae strains. For the subjects infected with mainly sensitive germs, improvement was statistically significantly more frequent in those with efficient broad-spectrum antibiotherapy –  $p=0.028$ ,  $OR=2.45$  (1.01-6),  $RR=1.56$  (1.05-2.33) –, while the negative evolution towards death did not show statistically significant differences ( $p=0.09$ ). The importance of efficient treatment is much higher for the subjects infected with multiresistant strains, with both improvement and death outcomes recording highly significant statistical differences  $p<0.001$ . Moreover, the presence of a suitable treatment can be considered a factor determining a favorable evolution –  $OR=6.34$  (2.32-18.18),  $RR=3.24$  (1.80-5.40) –, while its absence is a death risk factor –  $OR=4.46$  (1.69-11.98),  $RR=1.84$  (1.2-2.81). This result matches the one obtained by Marin H. Kollef and his colleagues, who first signaled the effect of inefficient empirical antibiotherapy, both for the general population of critical ICU patients and for the subpopulation with infection-susceptible mortality [8]. In a linear regression model, such a therapy proved to be the most important factor determining mortality among critical patients ( $p<0.001$ ,

$OR=4.27$ ). Jacobs and his partners showed, in a 2003 study, that inappropriate empirical antibiotherapy is significant risk factor for tracheostomy patients who have developed nosocomial pneumonia [9].

## CONCLUSIONS

The present study highlights the implications of first intention empirical antibiotherapy for the subsequent clinical evolution of patients with severe Enterobacteriaceae strain infections hospitalized in an ICU. In agreement with the results in the literature, inappropriate treatment proved to be a significant mortality risk factor among the subjects infected with multiresistant strains. Unlike these, the patients in the first group showed an unfavorable evolution, independent of the empirical treatment prescribed, probably due rather to background pathology than to the superadded infection.

This substantial impact of the initial antibiotherapy makes it necessary to know the circulating microbial flora and the resistance phenotypes in detail, in order to maximize the therapeutic chances, advice meet in the entire specialty reference material [10].

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# THE NUTRITION BEHAVIOR AND THE HEALTH CONDITION OF A MINERS SAMPLE FROM THE JIU VALLEY

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## REZUMAT

*Între alimentație și starea de sănătate se manifestă o interacțiune complexă, în sensul că alimentele pot menține starea de sănătate a individului prin calitatea lor igienică și nutrițională. Nutriția este esențială atât în controlul, cât și în prevenirea bolii. Multe complicații pot fi evitate printr-o urmărire atentă a statusului nutrițional sau prin prevenirea apariției deficitelor nutriționale. Organizația Mondială a Sănătății a recomandat instituirea de programe naționale de cercetare a alimentației, în vederea realizării unei supravegheri active a stării de sănătate nutrițională. În prezenta cercetare, s-a urmărit cunoașterea mai aprofundată a alimentației și a unor aspecte ale stării de nutriție pe eșantioane reprezentative de muncitori din întreprinderile de exploatare a cărbunelui în mine subterane din Valea Jiului (Lonea-Petrila-Livezeni). Pornind de la politicile nutriționale și alimentare, se impune adoptarea unor pachete de măsuri, realizarea unor proiecte și programe complexe în vederea identificării și prevenirii aspectelor care pun în pericol alimentația echilibrată.*

**Cuvinte cheie:** boli de nutriție, silicoză, factori de risc

## ABSTRACT

*There is a complex interaction between alimentation and health level: aliments can keep the health level of a person because of their hygienic and nutritional quality. Nutrition is essential both in control and prevention of diseases. A lot of complications can be avoided or modified with a better tracing of the nutritional status or with prevention of nutritional deficiencies forming. An efficient treatment of the patient implies a detailed evaluation of the diet and nutritional status. The changes occurred in population alimentation are not always favourable none obeying the basic principles of rational alimentation. On the contrary, some mistakes are constant or new ones appear, and lead to imbalance and abuses with bad effects to the organism progress, its health status, and environment. When the mistakes are accentuated or are carried in time, even 'nutritional diseases' may develop. World Health Organization has recommended the implementation of national programs related to alimentary behaviour investigation in order to make an active supervision of the nutritional health level. The study deals with the alimentation of workers in coal mine exploitation from the Jiu Valley, especially on the structure of the free eating menu given before going to work.*

*The present research resulted in a better knowledge of alimentation and nutrition level on workers representative samples, from coal mines exploitation in the Jiu Valley (Lonea-Petrila-Livezeni). Nutritional and alimentary policies imposed the implementing of proper packs of measures, projects and complex programs that should identify, analyse, prevent and counteract aspects which lead to higher levels of risk for alimentation and balanced nutrition*

**Keywords:** *nutrition diseases, silicoses, risk factors*

## INTRODUCTION

The alimentation represents the behaviour with the highest influence on people's state of health.

The problem of the interaction between alimentary behaviour and the state of health, of the potentially harmful effect of food on the healthy or diseased organism, is a problem of actuality.

Some researchers in this area assert that 90% of all maladies (excepting infectious diseases and accidents) are in connection with the alimentation [1,2].

The specialists agree that human life, the status of health, depend on what they consume daily, both quantitatively and qualitatively. For maintaining a normal nutritional state, the consumed aliments must provide the human organism the necessary nutritional substances in optimal conditions [2,3].

The essential problem in establishing a balanced nutrition is that, although it is possible to determine a general reference model, this must be always adapted to the individual needs. Alimentary needs vary significantly from one person to another, depending on age, weight, sex, the type and intensity of activity (physical, intellectual) and the environmental conditions (warm, cold, the presence of chemical substances, etc.) [3].

## OBJECTIV

In this context, the present study aimed to obtain information on the structure of alimentation and the nutritional status of the

miners in the Jiu Valley, from coal mines in Lonea-Petrila-Livezeni.

This work is to contribute to tracking down the errors in the nutrition and to early finding and to discard or limit the known factors, able to modify the quality of life and the health status of miners.

## MATERIAL AND METHOD

The study was conducted on representative samples of workers in the coal mines from the Jiu Valley (Lonea-Petrila-Livezeni), counting a total number of 7807 subjects.

As it is known, the status of nutrition may be studied either by examining the nutritional value of the food ration (alimentation's structure survey) and comparing the obtained results to the corresponding guideline for the respective lot, or by controlling the nutritional effect, the real decisive factor not only for alimentation evaluation, but also for appreciating the health status of the miners. The concomitantly use of the two methods increases the scientific value of the action and allows a complete control of the nutrition status.

For determining the alimentation type data from daily lists of aliments taken from the storage were used and the quantities of aliments consumed in 10 consecutive days were extracted, for the respective number of miners, in every term of the year. Trough calculation the medium daily quantity for each aliment and person was determined, and by addition of terms medium and division by four the annually daily medium was determined.

Using tables of aliments composition, the medium daily content of calories, proteins, lipids and carbohydrates was calculated.

Every miner was also submitted to e exam consisting in somatic and laboratory determinations:

- Measuring the body height and weight.
- Physiologic and pathologic anamnesis, underlining the chronic diseases and deficiencies that may influence the nutrition status.
- Determining in blood samples haemoglobin, Ht, total proteins, alkaline phosphatase and calcium, phosphorus, magnesia, and iron ions.

## RESULTS AND CONCLUSIONS

1. The sample consisted in 320 miners.

2. Based on their activity, the workers in the sample were grouped in: miners and miner helps, locksmith, wagon driver, stoker, CAMS specialist, fire worker, signalize person, electrician, mechanic, welder, and engineer.

3. On age groups, the repartition was:

- 20 – 30 years = 30
- 31 – 40 years = 179
- 41 – 50 years = 95
- 51 – 60 years = 16

4. A percentage of 43.37% is represented by the locomotors apparatus diseases (lumbar dischopathy, herniated disks, ankylosing spondylitis), followed by pulmonary fibroses 15.23%, digestive diseases (gastric - duodenal ulcer 18.09%), cardiovascular diseases 11.42%, respiratory diseases (asthma 0.6%, BPOC 1.9% and first stage silicosis 0.01%) hypoacusis 0.21%, carbon monoxide intoxications 0.28%, disc hernia 0.2%, these diseases being related to the profession (Figure 1).

5. As for the body weight and the frequency of apparition for some diseases, the worker's nutrition status may be connected to their aggravation. It was ascertain the percentage of people with normal body weight was 56 %, low body weight persons represented 20%, and overweight persons represented 23.94% medium of the sample. It is possible some chronic diseases, related to the nutrition status, present in a few investigated subjects, may have contributed to the decrease in body weight. Percentages were higher for the age group 40 – 50 years (Figure 2).

6. In conformity with CCM – the personal working underground, receives a warm meal at the beginning of the shift. The calories necessary is 4000 – 5000 calories/day, the warm meal representing 40 – 50% of the total calories necessary of 1800 calories/ration.

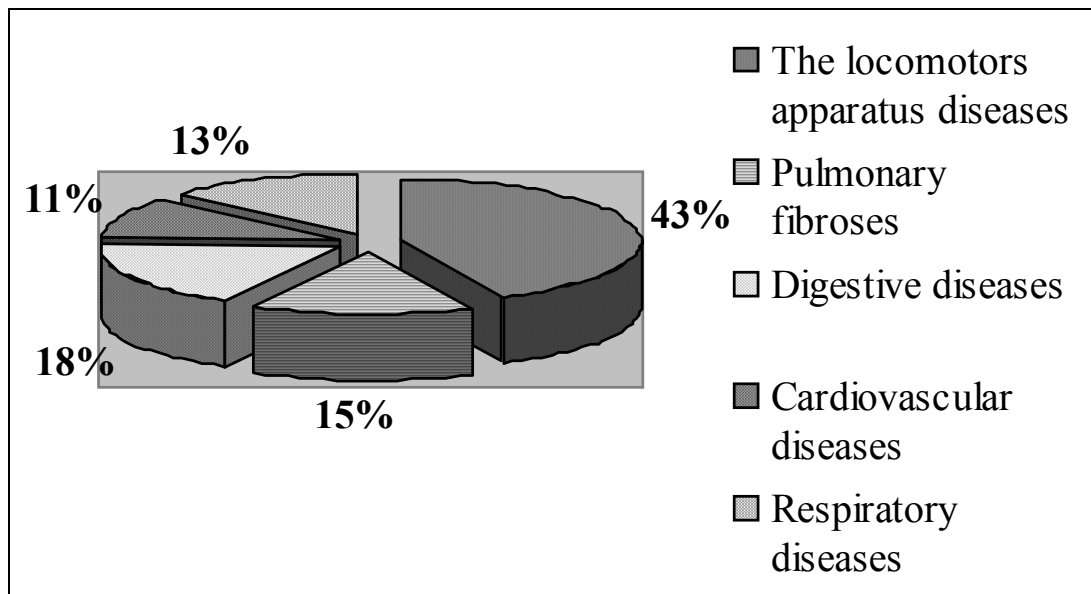


Figure 1. The percentage distribution of the diagnosed diseases

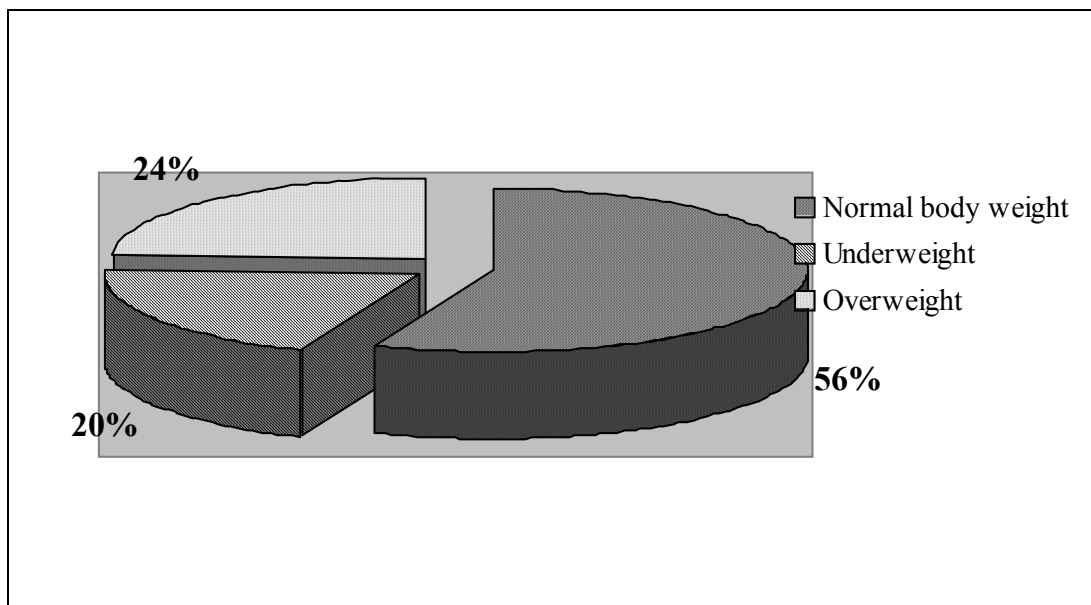


Figure 2. The percentage distribution of the miners based on the body mass index

## CONCLUSIONS

1. The inquiry on the nutritional behavior also highlighted the existence of a few imbalances and mistakes (animal fat and starch excess) which, maintained for longer periods of time, may have a bad influence on the health status and the work capacity of investigated persons.

2. Taking into consideration the physical effort in conditions of hard work, and the presence of chronically diseases associated, an alimentary supplement must be added to the basic menu.

3. The nutritional behavior of underground workers (coal mines) correlated to severe or less severe forms of disease they have, evince just how important is to impose better primary and secondary prevention

means for cardiovascular, digestive, nutrition diseases, etc., through correct alimentation.

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# EVALUATION OF ACTUAL SITUATION ON PREVENTION OF IODINE DEFICIENCY MALADIES

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## REZUMAT

*Acest articol constituie o prezentare bibliografică a problemei deficitului de iod în rația alimentară a ființelor umane, a stării de sănătate a populației prin prisma bolilor cauzate de deficitul de iod și a metodelor profilactice ale acestuia. Un mare număr de analize a fost efectuat în diferite țări, cu privire la recomandările consumului de iod pentru a se stabili un necesar zilnic de iod pentru organismul uman. Luând în considerare conținutul nesemnificativ de iod a solului din Republica Moldova, trăsătură prezentă de asemenea în alimente și în apă, devine evidentă necesitatea iodării apei potabile în concordanță cu experiența altor țări.*

**Cuvinte cheie:** iod, boli prin deficiență de iod, echilibrare, profilaxie, iodarea apei

## ABSTRACT

*This is a bibliographical presentation of the problem of iodine deficiency in the food ration of human beings, of the population's status of health through maladies caused by iodine deficiency and of its prophylaxis methods. A range of analyses were performed concerning iodine recommendations in different countries intended to provide daily necessary of the human organism in iodine. Taking into consideration the insignificant iodine content in soils of the Republic of Moldova, evident in the aliments and in the water also, arise the necessity for iodination of drinking water accordingly to the experience of other countries.*

**Keywords:** iodine, maladies of iodine deficiency, balancing, prophylaxis, iodination water

## INTRODUCTION

The influence of iodine deficiency on the health of human being is a global and very old problem. The first annals on this issue

appeared to early ancient scripts of Indians and of Chinese, in the manuscripts of Hippocrates, Celsius, and Avicenna. Since those historical periods and over the centuries, iodine deficiency was considered

more and more as manifested by hyperplasia of thyroid gland. But modern researchers denote a larger range of clinical implications.

In the present it is demonstrated that iodine deficiency in the organism is caused by deregulation of the thyroid gland's function and first of all by appearance of endemic goitre. Iodine deficiency creates new conditions for the functions of the organism and for the metabolic system. All these situations have been entitled by the experts of the World Health Organization as maladies of iodine deficiency.

## MATERIAL AND METHOD

For this study we used the local and world publications on problems of iodine deficiency, methods of adding iodine to diverse aliments, iodine dissemination in nature, possibilities of iodination of bottled drinking water.

## RESULTS AND DISCUSSIONS

The iodine is a component of major importance of the hormones of the thyroid gland -thyroxine and 3, 5, 3 – triiodothyronine, hormones with a specific role in the metabolic processes of human organism and that of animals. For the synthesis of the mentioned hormones, the adult human organism need an intake of about 150 µg of iodine every day; as a rule iodine is consumed concomitantly with food and drinking water. Romanian scientists (Lucia Alexa, 1994, BrigithaVlaicu, 1996) and other scientists also, consider that necessary quantities of iodine for the organism to provide optimal function of thyroid gland are 100-200 µg of iodine per 24 hours for humans. As the soils in the Republic of Moldova are poor in iodine and, as a consequence the aliments and natural waters are also poor in this element, they are described as having low iodine content, and the human organism is not provided with the

necessary quantity of this microelement [6, 15].

In case of iodine deficiency, the organism reacts through hyperplasia of the thyroid gland and by expanding (endemic goitre), that leads to retard in the physical and intellectual development as cretinism, deaf-mute children etc. [7,8,9,18]. The scientists of Romania denominate the endemic goitre as endemic thyreopathic dystrophy [14].

According to data of the Health World Organization over 1.5 milliards of the world population suffer from maladies of iodine deficiency, 655 millions of people have hyperplasia of thyroid gland, 43 millions present expressed mental retard [18].

According to data of I. T. Matasar and co - authors in 2002 in Ukraine were over 15 millions of people inhabitants of endemic territories concerning iodine, i.e. 1/3 of the population are under risk of suffering from maladies of iodine deficiency.

The deficiency of iodine in the food ration of the inhabitants of the Republic of Moldova continue to bring up considerable prejudices to the population's health, being manifested through mental retard, diverse neurological affections, endemic goitre, mental incapacities [9]. According to data of Galina Obreja and her co - authors (2003), 37% of children between ages of 8-10 years have palpable or visible Derbyshire neck caused by iodine insufficiency in their food; the average iodine concentration in urine was of 7,84 µg /dl. Authors consider that about 90% of the consequences of iodine shortage remain unrevealed, and are manifested through: spontaneous abortions and premature births, diverse congenital anomalies, increased perinatal and infant mortality, congenital neurological cretinism, retard of mental and physical development, reduced cognitive capacities. V.Țurcan and co-authors (2003) stated that for population of Balti county iodine insufficiency is a problem of great importance, that evince

through morbidity caused by thyroid gland, that has increased during the recent 5 years by 7,6 times. The implementation of iodinated salt for human consumption in Straseni district have led to decreasing of thyroid gland's hyperplasia at children more than twice [13].

Evidently, it is necessary to eradicate these pathological states by abolishing iodine deficiency. To achieve this goal there were outlined different preventive methods. Some of them are the following:

- including in the food ration more sea products that are rich in iodine;
- prescription of iodine drugs like – antistrumin, iodized potassium;
- parenteral administration by adding iodine in the oil content solutions;
- the administration of complexes of vitamins and iodine etc.

According to recommendations of the World Health Organization there was elaborated a first National Program in the Republic of Moldova for eradication of diseases caused by iodine deficiency, approved by the Government in January 1998[12]. This program provides that all salt for sale must be iodized. Salt will contain between 25 and 35  $\mu\text{g}$  /kg of potassium iodide. As a matter of fact during 2001 - 2002 only 40-48% of the salt samples contained the recommended level of iodine.

For other salt samples the iodine content was lower or even the iodine, in general, was absent. For example, in 25,4 % of samples in year 2001 and in 19,4% in year 2002 the contents of iodine were between 10 and 24  $\mu\text{g}/\text{kg}$ , in other 21% of samples was mere iodine content and in 13,5% and 11,5 % of samples was not revealed iodine at all [9]. Similar data with reference to areas of Rezina and Florești districts and of Balti county have been achieved by N. Benchechi and co-authors in 2003, by L. Mărgineanu and G.Tanasov (2003) and by V. Țurcan and his co- authors (2003).

Besides all mentioned facts, the population is also not entirely conscious of the necessity of using iodinated salt. A new National Program for eradication of the disturbances of iodine deficiency (TDI), approved by the Government of the Republic of Moldova at 17.05.2007 foresees the increase of the number of families using iodized salt to 90% in 2009.

In the monitoring system for evaluation of iodine consumption by human organism the main index is the curve of iodine secretion in urine [9]. The quantity of iodine for the organism is considered sufficient when this index in the urine is 100-199  $\mu\text{g}$  per liter. V.I. Kravcenko and co- authors (2001) also consider the normal secretion of iodine in the urine to be over 100  $\mu\text{g}$  per 1 liter. Authors confirm that before using iodine water only 0-42% children have a iodine secretion of over 100  $\mu\text{g}$  per 1 liter. After daily consumption of iodinated water with 50 to 100  $\mu\text{g}$  of iodine per 1 liter during 3 months, the level of iodine secretion in the urine has been normalized up to 90-100 % of children, and thus amounts 118-161  $\mu\text{g}$  per 1 liter were found.

To maintain this index at normal level it is necessary to use iodine in food as iodized salt or iodinated water in respective quantities. Thus human organism is provided with sufficient quantities of iodine, depending on sex group, age and type of activity etc. With all this elements in view in different countries have been proposed different norms for the iodine intake, with variation between 15-290  $\mu\text{g}$  per day (see table nr. 1). According to data of M. Popovici, U. Jalbă, V. Ivanov (2007) the norms for physiological necessities of different groups of population approved by Ministry of Health of the Republic of Moldova varies between 0,04 - 0,2 mg per day.

Of course, to cover the necessary quantity of iodine first of all natural products should be concerned. In connection with this, it is



important to acknowledge that an increased level of iodine is available in the cernoziom soils rich in humus and territories near sea,

in valleys, in the products of sea origin, in some minerals [14].

**Table 1. Recommended intake of iodine ( $\mu\text{g}$  per day)**

<i>Groups</i>	<i>WHO /FAO</i>	<i>EU<sup>a</sup></i>	<i>North countries</i>	<i>Russian Federation</i>	<i>United Kingdom</i>		<i>United States</i>	
					<i>LRNI<sup>b</sup></i>	<i>RNI<sup>c</sup></i>	<i>EAR<sup>d</sup></i>	<i>RDA<sup>e</sup></i>
Overall	-	-			-		-	
Males, RDA			150	150		140		150
Males, EAR			100	-		-		-
Males, minimum <sup>f</sup>			70	-		-		-
Females, RDA			150	150		140		150
Females, EAR			100	-		-		-
Females, minimum			70	-		-		-
Infants			-	-				-
Premature	30 <sup>g</sup>	-			-	-	-	
0-3 months	15 <sup>g</sup>	-			40	50	110 <sup>h</sup>	
4-6 months	15 <sup>g</sup>	-			40	60	110 <sup>h</sup>	
7-9 months	135	50			40	60	130 <sup>h</sup>	
10-12 months	135	50			40	60	130 <sup>h</sup>	
Children			-	-				
1-3 years old	75	70			40	70	65	90
4-6 years old	110	90			50	90	65	90
7-9 years old	100	100			55	120	65	90
Adolescents			-	-				
Males, 10-11 years old	135	120			65	130	73	120
Males, 12-14 years old	110	120			65	130	73	120
Males, 15-18 years old	110	130			70	140	95	150
Females, 10-11 years old	135	120			65	130	73	120
Females, 12-14 years old	110	120			65	130	73	120
Females, 15-18 years old	110	130			70	140	95	150
Adults			-	-				
Males, 19-65 years old	130	130			70	140	95	150
Males, 19-24 years old	130	130			70	140	95	150
Males, 25-50 years old	130	130			70	140	95	150

Males, 51-65 years old	130	130			70	140	95	150
Females, 19-65 years old	110	130			70	140	95	150
Females, 19-24 years old	110	130			70	140	95	150
Females, 25-50 years old	110	130			70	140	95	150
Females, 51-65 years old	110	130			70	140	95	150
Elderly people			-	-				
Males, under 65 years old	130	130			70	140	95	150
Females, under 65 years	110	130			70	140	95	150
Pregnant women		-	-	-	-	-		
First trimester	250						-	-
Second trimester	250						-	-
Third trimester	250						-	-
14-18 years old	-						160	220
19-30 years old	-						160	220
31-50 years old	-						160	220
Lactating women		160	-	-	-	-		
0-3 months	250						-	-
3-6 months	250						-	-
7-12 months	250						-	-
14-18 years old	-						209	290
19-30 years old	-						209	290
31-50 years old	-						209	290

Legend:

a= Acceptable range of nutrient intake

b =LNRI = lowest recommended nutritional intake

c =RNI = recommended nutritional intake

d =EAR = estimated average requirement of nutrient

e =RDA = recommended daily allowance of nutrient

f =Minimum = minimum required nutritional intake to prevent deficiency

g =Adequate intake based on mg/kg body weight

h =Adequate nutrient intake

The calcareous podzolic (sandy, or peaty) soils, those of mountain zones and of flat land, the surface waters and underground waters are poor in iodine. In order to

balance the available iodine rate in the food ration it is necessary to include the most diverse products relatively rich in this element. Thus, according to the guide

„Chemical composition of aliments” [23] the rate of iodine contents in the aliments of vegetal and animal origin depends in considerable extent of the soil’s content in this element. The authors states that the iodine contents in the aliments is insignificant and is about 4-15 µg. But its contents in the sea and oceanic fish is about 70 µg of iodine and even more per 100 g, in the sturgeon liver – up to 800 µg, in laminaria, depending of species and harvesting season - from 50 to 70000 µg. However, it is necessary to take into account that during a long - term storage or thermal treatment of products a considerable part of iodine (20-60%) is lost.

It must be pointed out that food traditions of the population of the Republic of Moldova practically do not include products rich in iodine. Traditionally, among the products used by the local population are the following: wheat with iodine contents of 5.2-11 µg in 100g of product, barley – 9.3, oath – 7.5, maze – 5.3, haricot – 18.7, peas -13.1, milk – 9, sour cream – 7, white cabbage – 3, potatoes – 5, onion – 3, carrot – 5, blue beet -7, walnut – 3.1, apple -2, grapes – 8, mushrooms champignon – 18, pork – 6.6; beef –7.2, liver – 6.3 –13.1 µg to 100g of product. All these data correspond to average indexes for ex URSS area. Apparently in our country the iodine contents in the aliments are different. At present time there are no specific data concerning these indices. There is no doubt that the complex of aliments used by population does not provide the sufficient quantities of iodine for organism.

A global indicator of iodine insufficiency for all environment of the specific zone, is the content of iodine under 5 µg in water sources [2,14,16], that actually reflects the iodine insufficiency not only in water and soil but also in the aliments, even if it is taken into account that the main part of iodine for the organism’s needs is gained from food. Consequently, the index of

iodine concentration in water has the role of „signalizing” [1].

The scientific researches carried out in the Republic of Moldova in the 70’s of the XXth century, revealed the increased rate of morbidity of the population through Derbyshire neck related to iodine deficiency in water. The author marked out the most insignificant of iodine concentration in the underground waters available in the central regions of our country (medium rate is 1.9-4.1 µg per 1 liter) and the highest in the waters of south regions (average rate 4.5-8.4 µg per liter). In the surface waters of Nistru and Prut, the iodine contents were relatively constant (4.2-6.9 µg per 1liter) depending on hydrological periods. The lowest concentrations were revealed in the periods of floods. The iodine concentration in artesian waters are up to 8.6 µg per liter.

Scientific researches performed in Romania [14] confirmed that over 50% of water sources in the country have a deficiency of iodine (under 5 µg per liter), thus reflecting the natural background deficiency of the environment.

The experimental investigations carried out in Ukraine [20] on laboratory animal subjected to radioactive irradiation in dose of 0.5 gray demonstrated the efficiency of antioxidant protection of iodinated water.

Thus, the problem of iodine deficiency in the organism remains in actuality and solutions are required. In this context, the majority of countries have chosen the way of bottled iodinated drinking water (Ukraine, Republic of Azerbaijan, Republic of Lithuania, Poland, Czech, Germany Hungary, Russia etc.), others (Belarus) – also took the way of iodination of such products as milk, kefir, bread, eggs.

Thereby, the majority of countries have stated the priority of iodination of bottled drinking water. The iodine dozing is quite variant. For example, in Poland iodination

of water is permitted in concentrations of 300 and 500  $\mu\text{g}$  per 1 liter, in Czech Republic - 150-300, in Hellenic Republic – 160, in Hungary – 100, in Belarus – 100–800, in Lithuania – 120–180, in Russian Federation – 40 – 125, in Australia - 150, in Ukraine – 100  $\mu\text{g}$  per 1 liter. All these countries, as well as others (Republic of Azerbaijan, Germany) have issued certificates for mass production of iodinated water. It is to mention also, that according to recommendations of the World Health Organization (1994) the maximum iodine intake with aliments must be 1 mg per day (17  $\mu\text{g}$  to 1 kg body weight). According to this recommendation in Ukraine it is permitted the mass production of water with contents of 100  $\mu\text{g}$  per liter, and in Czech Republic – of 500-600  $\mu\text{g}$  per 1 liter. We arrived to conclusion that the norms of World Health Organization are controlled and accepted according to life experience.

According to data of V.N. Melnichenko, A.P. Iaroshchiuk, V.I. Maxin (2004) the insufficient assimilation of biogenic elements from aliments in Russian Federation is for calcium 30-40 %, for iodine – 80 %, for selenium – 80-100 % (the estimations have been performed by Institute of Nutrition of the Russian Academy of Sciences). Authors have proved that drinking water, enriched with microelements, represents a useful instrument in the prophylaxis of a number of problems of the human organism. In Russia, for example, natural iodinated water so called „Arhyz” is produced with low mineralization and iodine contents - of 0.1 mg per 1 liter.

In the Vologodsk region (region of Onega Lake) is produced water „Aqua Liux” on the basis of artesian water enriched by iodine ions (40-60  $\mu\text{g}$  per 1 liter). The medium mineralization of water is equal to 350-500  $\mu\text{g}$  per one liter.

In the Moscow region, from artesian wells of 200 meters depth, by enrichment with iodine and fluorine ions, is produced a water product named „Korolevskaya voda”.

The problem of iodine deficiency is also critical in Ukraine. One of the producers of drinking iodinated water in Ukraine is „Rosinka” company (Kiev). Its output product named „Doctor” represents a natural drinking water, hydro carbonic, containing magnesium, calcium and sodium, with mineralization of 0.4-0.7  $\mu\text{g}$  per 1 liter and iodinated with iodine contents of 50-60  $\mu\text{g}$  per 1 liter.

Iodinated drinking waters, produced on basis of „Iodis-Concentrat”, are much more spread. Iodis-Concentrat, (Iodis Concentrate) TU U 14326060.003.98 – is a product of scientific company ” Iodis” and of International Trade Concern „Iark Kiev”, a national and International patentee – represents a hydro complex of iodine compound, created on basis of natural artesian water. Within system of „ions iodine - water”, classic name of iodine and iodination creates insignificant association of hydrogen, but in „Iodis Concentrat” – with strong association of oxygen. Thus is explained the biological activity and the high capacity of assimilation of low concentration.

## CONCLUSIONS

The results of researches conducted prove the possibility of iodination of some products in the Republic of Moldova as a necessary measure in providing population with sufficient intake of iodine and as prophylaxis of maladies caused by iodine deficiency. One of the most feasible way is iodination of bottled drinking water proposed by Limited Liability Co. „Gelibert”.|

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# DENTAL DECAY IN A GROUP OF PATIENTS FROM TIMIȘOARA: PRIMARY (PROPHYLAXIS) AND SECONDARY PREVENTION

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## REZUMAT

În studiul realizat am investigat factorii de prevenție primară (profilactici) și secundară cu rol în prevenirea cariei dentare. Metoda de lucru a fost ancheta epidemiologică transversală cu aplicarea unui chestionar specific pe un eșantion format din 50 pacienți (62% femei și 38% bărbați) diagnosticați și tratați pentru afecțiuni dentare în Clinica nr. 3 de medicină dentară, Timișoara, investigați timp de 3 luni (februarie, martie, aprilie) în anul 2008. Grupa de vârstă cea mai frecvent afectată de patologia dentară a fost 15-30 ani (56%). Caria dentară a fost predominantă la femei (69%) și la bărbați (58%). Măsurile profilactice aplicate pentru prevenirea formării plăcii dentare au fost insuficiente: 90% dintre pacienți nu au efectuat profilaxia cu fluorură de sodiu, 48% și-au spălat dinții numai de 2 ori pe zi, 36% au folosit ața dentară de 1-3 ori/săptămână, 26% dintre pacienți nu au folosit niciodată guma de mestecat, iar 50% au folosit guma de mestecat după servirea mesei. Măsurile de prevenție primară (detartraj și periaj profesional) și secundară (diagnostic precoce și tratament) a cariei dentare, aplicate la eșantionul investigat, au fost de asemenea insuficiente: 46% dintre pacienți au făcut tratament stomatologic (1 dată/mai mult de 5 ani), 28% dintre pacienți nu au făcut niciodată detartraj și în aceeași proporție periaj profesional. O aplicare eficientă a măsurilor preventive secundare și primare, ceea ce înseamnă 1 tratament stomatologic, detartraj și periaj profesional/6 luni a fost realizată doar de către 14%, 10% și respectiv 14% dintre pacienți. În concluzie, pacienții cu carie dentară nu au aplicat în mod eficient măsurile profilactice și preventive secundare, determinând creșterea riscului de carie dentară.

**Cuvinte cheie:** carie dentară, prevenție

## ABSTRACT

In the present study we investigated the primary (prophylactic) and secondary preventive factors implied in prevention of the dental decay. The method was a transversal epidemiological survey with a specific questionnaire applied to a sample consisting of 50 patients (62% women and 38% men) diagnosed and treated for dental diseases in Clinic of

*Dental Medicine no. 3, Timișoara, investigated for 3 months (February, March, April), during the year 2008. The age group most affected by dental diseases was 15-30 years (56%). Dental decay was predominant in women (69%) and men (58%). The prophylactic measures applied to avoid the occurrence of dental plaque were insufficient: 90% of patients did not make prophylaxis with Natrium Fluoride, 48% brushed their teeth only 2 times/day, 36% used dental floss 1-3 times/week, 26% of patients never used chewing gum and 50% of patients used chewing gum after meal. The primary preventive (plaque removing and professional brushing) and secondary preventive measures (early diagnostic and treatment) applied for dental decay were also insufficient: 46% patients had dental treatment (1 time/more than 5 years), 28% patients never had plaque removing, and the same number did not had professional brushing. An effective applying of secondary and primary preventive measures, which means 1 treatment, plaque removing, professional brushing/6 months, was realized only by 14%, 10% and 14% of patients, respectively. In conclusion, the patients with dental decay did not apply efficiently the prophylactic and secondary preventive measures, determining the increase of dental decay risk.*

**Keywords:** dental decay, prevention

## INTRODUCTION

Dental decay is a microbial pathological process of the hard dental tissues, related to the dissolving and localized destruction, with lesions of the pulp and apical parodontium in the end, and its complications could affect the entire body. The etiological agent of the dental decay is the bacterial plaque, a gelatinous, pellucid and adherent material to the dental surface of the teeth. The existence of the dental decay could severely affect the oral cavity's health through the complications which may occur: pulp's infections, gangrenes, apical parodontitis, and focal diseases [1]. Dental prophylaxis (primary prevention) consists of the plaque removing and teeth cleaning with the purpose to prevent the development of the cavity and the disturbance of the gums. Saliva has an essential role in the protection against dental decay. Far enough to be an inactive structure, the enamel from the teeth surface suffers a continuous process of dissolving (demineralization) and reforming (mineralization), and the mineral elements from saliva have an important role in this process [2]. During the sleep it occurs the dryness of the oral cavity, this is the reason that teeth brushing before sleeping and avoiding food ingestion after teeth brushing is so important [3]. Prophylaxis with natrium fluoride, administered orally together with the water with a corresponding

fluoride composition or with food, is especially efficient in dental decay prevention. Water fluorination was proved to be the most efficient method considering the money spent in dental decay prevention. Local administering of natrium fluoride, through local applications or through the use of tooth paste with fluoride, represents also a way to prevent dental decay [5]. Prophylaxis refers also to the teeth cleaning as a preventive measure against periodontal diseases (gum diseases) and dental decay. This may include plaque and dental tartar/calculus detection. In prophylaxis are applied the procedures of dental superficial layers removing and dental polishing (professional brushing). Dental superficial layers removing consist of plaque and litho removing from the dental surface together with the periodontal pockets from the gum edge. Dental polishing has the role to maintain the smooth surface of the teeth [6]. Secondary prevention consists of the early diagnosis and treatment of dental decay. Dental treatment with Kanamycin gel, before and after tooth restoration, reduced with 46% the dental surfaces where new decays occurred, in comparison with control sample, during 14-36 months after application [7]. The attitude, the knowledge and the healthy practices of the population referring to prophylaxis and secondary



prevention of dental decay are determinant in community dental health maintaining [8].

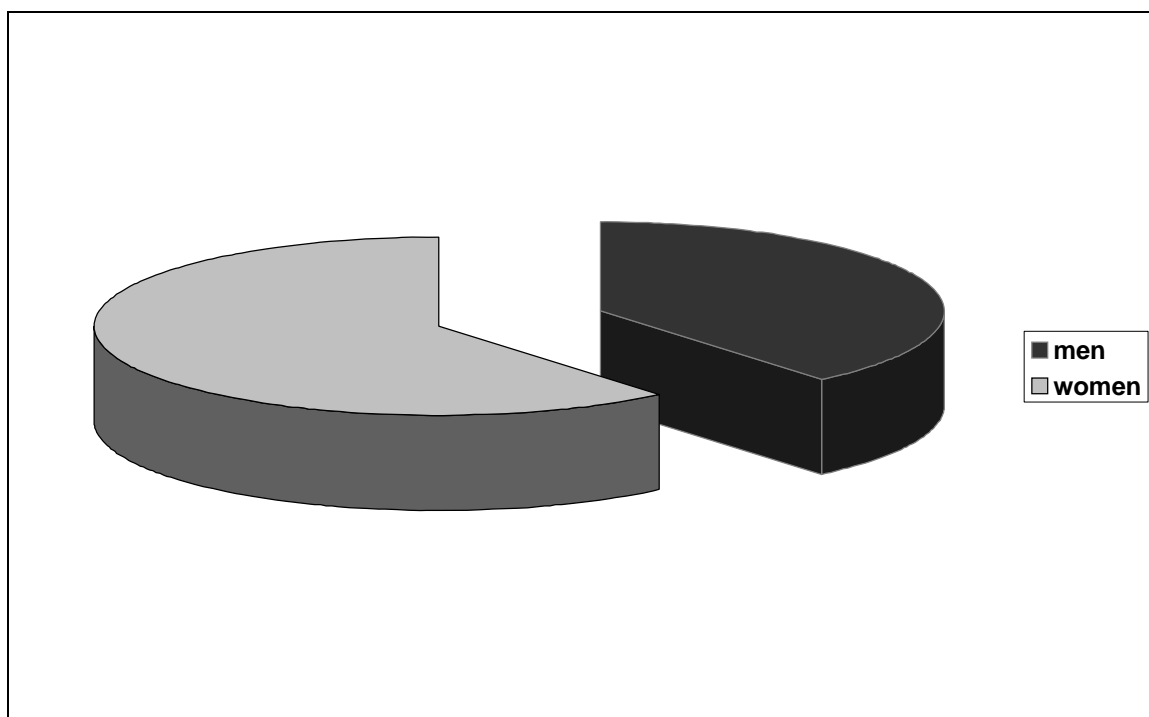
## MATERIAL ȘI METHOD

In the present study we investigated factors with primary (prophylactic) and secondary prevention role related to dental decay in a group of patients treated in the Dental Policlinic Timisoara (Policlinic no. 3) during a period of three months. The study was performed on a sample consisting of 50 patients diagnosed with dental diseases and treated in Policlinic no. 3, Timisoara, investigated in the year 2008, during 3 months (February–March–April). The method was transversal epidemiological

survey with a specific questionnaire applying, consisting of 10 items referring to prophylaxis and secondary prevention factors of dental decay, and the use of primary evidences (the files of patients diagnosed and treated for dental decay). The questionnaire was individually applied keeping the anonymity. For data processing we used a statistical program (Excel 2003).

## RESULTS

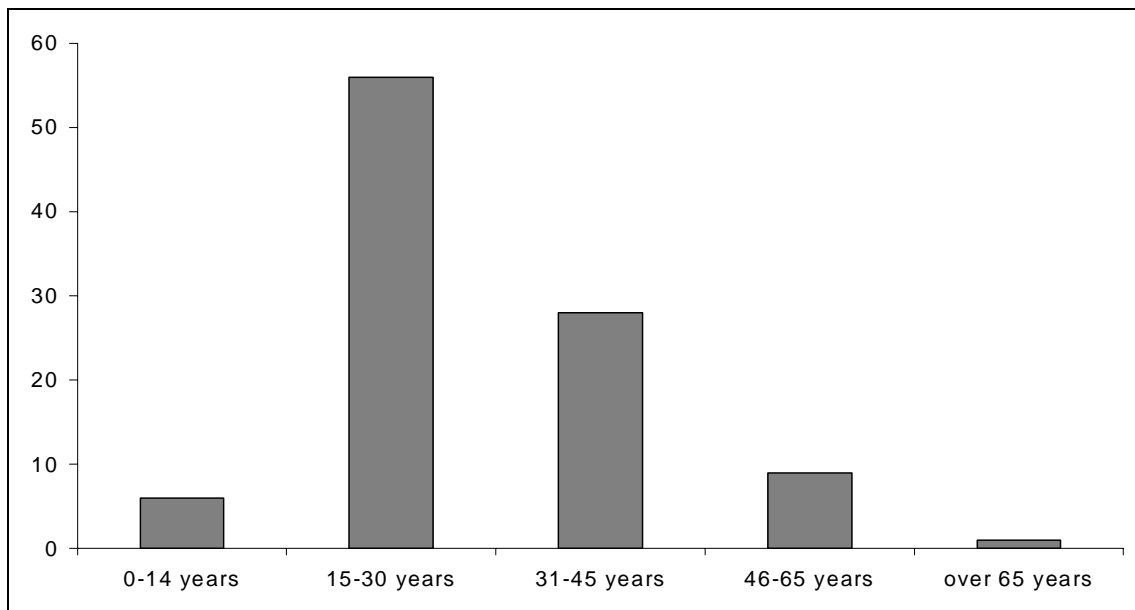
Dental decay distribution on sexes and age groups of the investigated sample  
The patients' distribution inside investigated sample was 38% men and 62% women (Figure 1).



**Figure1. Patients' distribution (%) on sexes of the investigated sample**

The repartition on age groups indicated a predominance of the patients in the age

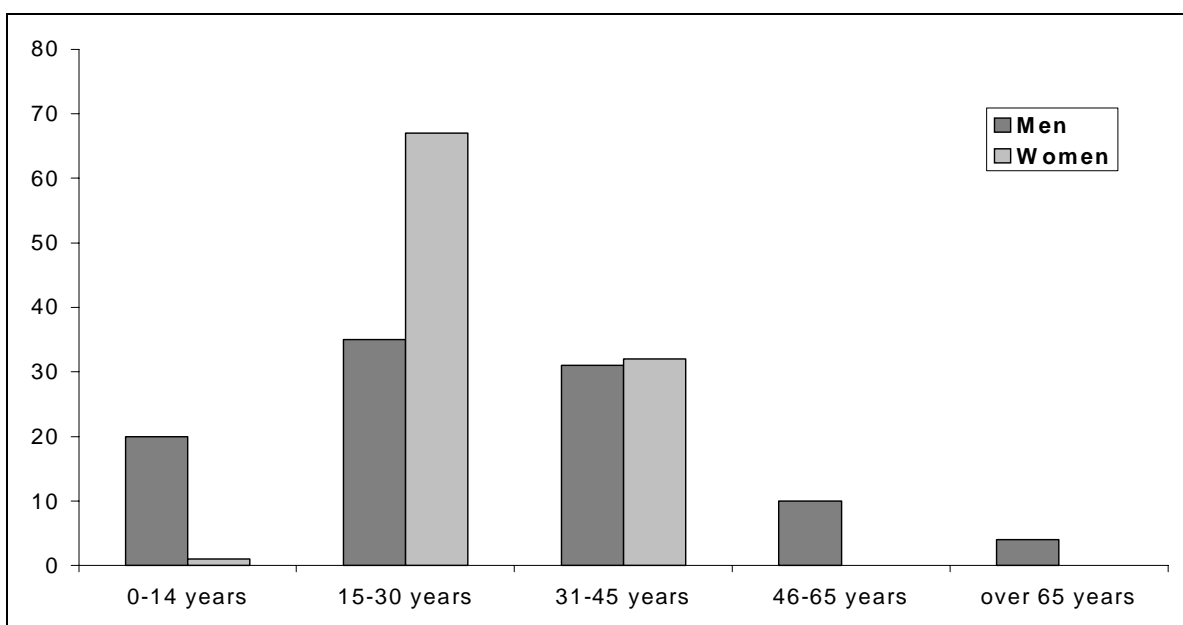
group 15-30 years (56%) and in the age group 31-45 years (28%) (Figure 2).



**Figure 2. Patients' distribution (%) on age groups of the investigated sample**

The same age group, 15-30 years, was predominant in women (68%) and also in men (35%). For men, increased percents were registered at the age groups 31-45

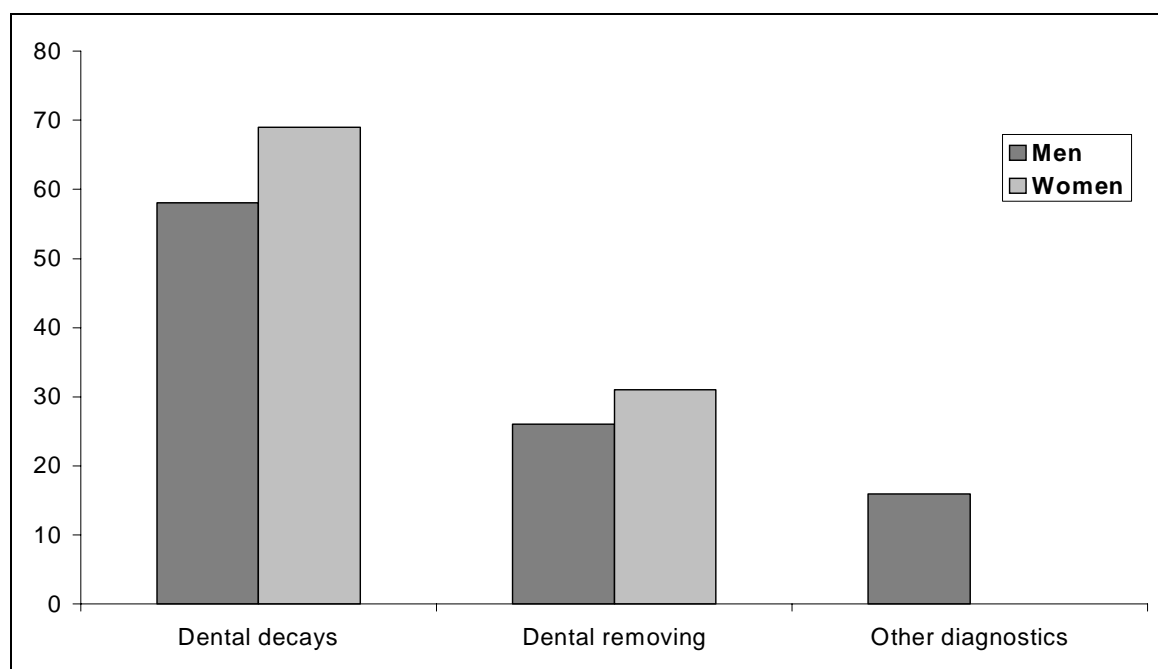
years (31%) and 0-14 years (20%), also. For women was also registered a relative increased frequency only for the age group 31-45 years (32%) (Figure3).



**Figure 3. Patients' distribution (%) on sexes and age groups of the investigated sample**

Referring to the investigated masculine population, 58% of patients had the diagnostic of dental decay, and in 26% of cases dental removing was performed. The

investigated feminine population had the diagnostic of dental decay in 69% of cases, and dental removing was performed in 31% of patients (Figure 4).



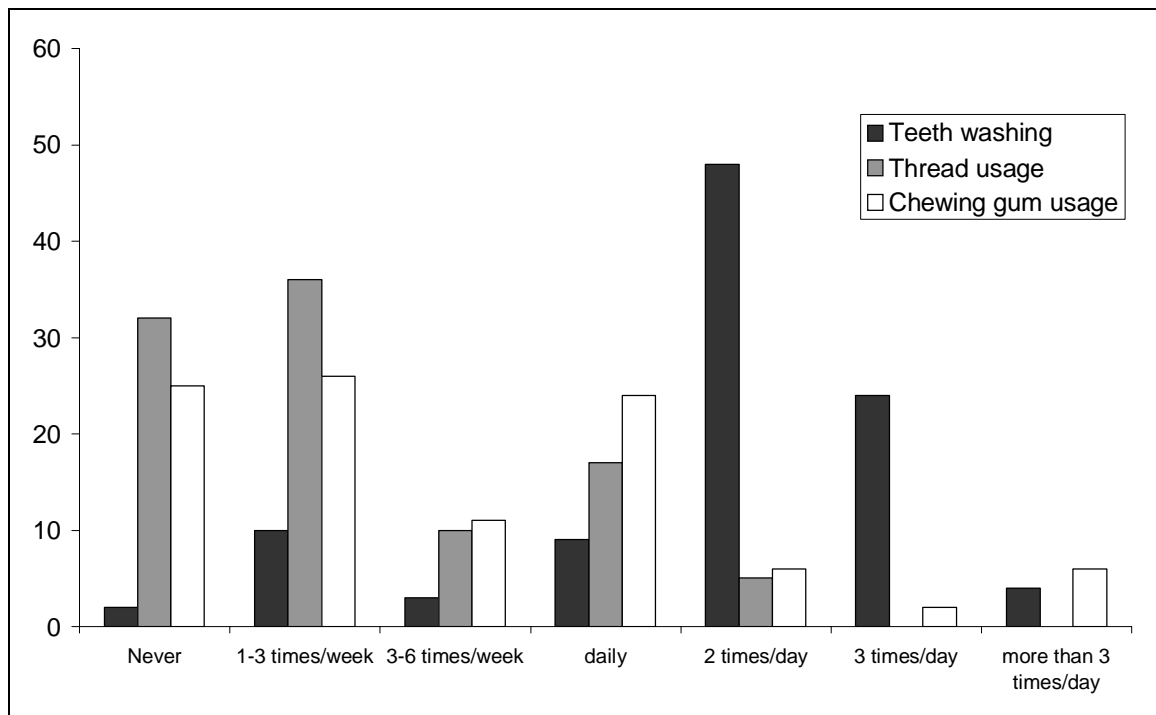
**Figure 4. Patients' distribution (%) depending on the presence of the diagnostic of dental decay**

The following primary prevention (prophylaxis) measures of dental decay forming and consequences of dental decay were investigated:

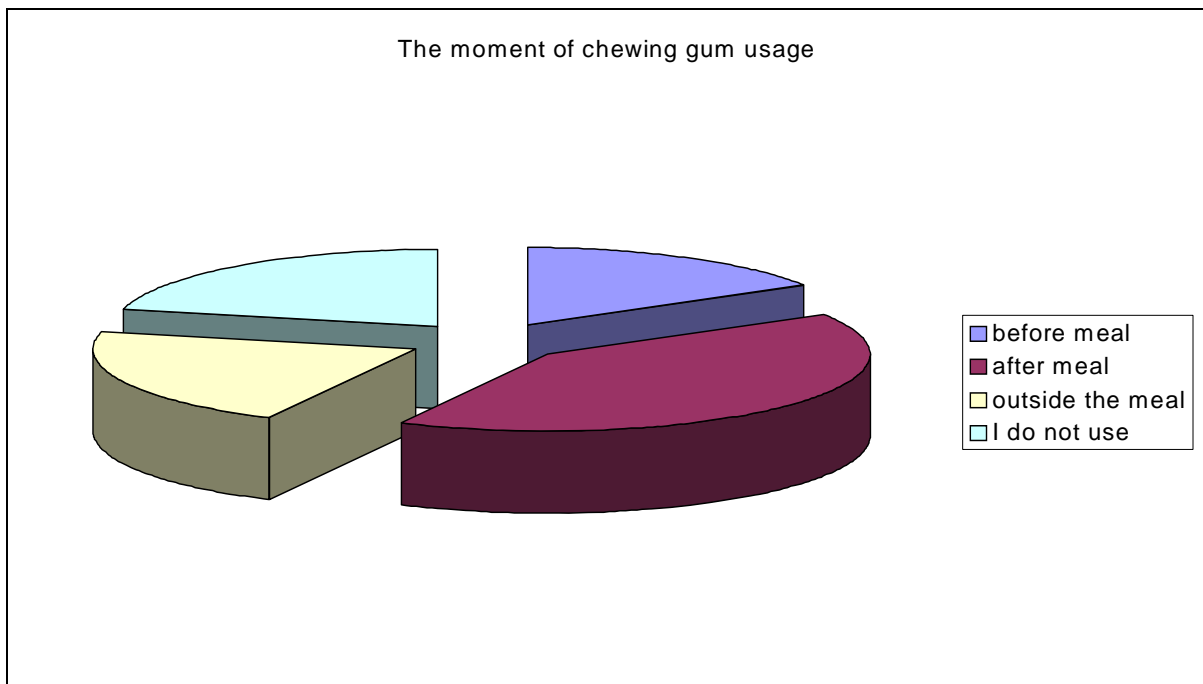
- natrium fluoride administering in the first 7 years of life,
- oral hygiene (teeth brushing)
- the usage of dental floss
- the usage of chewing gum after food consumption.

The majority of patients (90%) did not perform dental decay prophylaxis through natrium fluoride administering in the first 7 years of life. Although it is well known that an efficient hygiene of oral cavity consists

of three times/day teeth brushing, only 24% of patients brush their teeth 3 times/day. An important per cent of patients (48%) brush their teeth 2 times/day (Figure 5). Some of them never used dental floss (32% of patients), and 36% use dental floss 1-3 times/week (Figure 5). Some of them never used chewing gum (26% of patients). The chewing gum was used 1-3 times/week by 26% of patients and daily by 24% of patients (Figure 5). A percent of 50% patients use the chewing gum after serving the meal, and 26% of patients never use chewing gum. A percent of 20% patients use chewing gum before the meal (Figure 6).



**Figure 5. Patients' distribution (%) depending on the use of the prophylaxis measures for dental decay prevention**



**Figure 6. Patients' distribution (%) depending on the moment of the chewing gum usage**

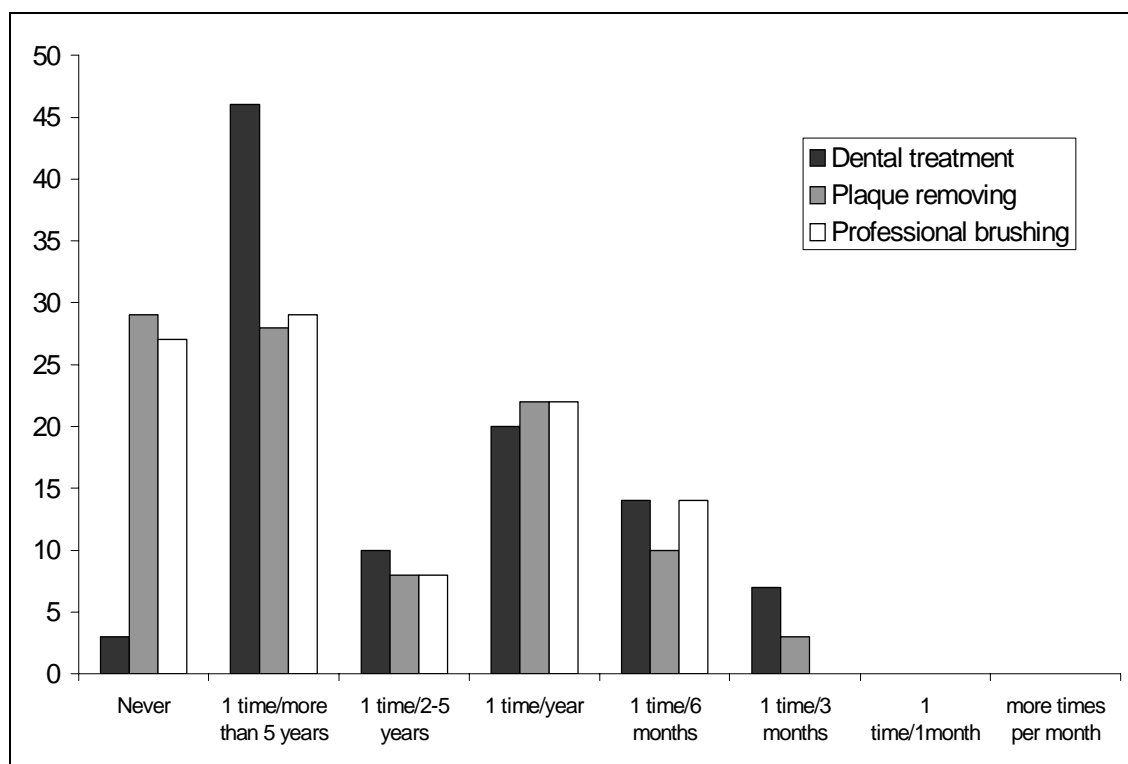
From the primary and secondary preventive measures related to the occurrence of dental decay there were investigated:

- the frequency of dental treatment (secondary prevention)

- the frequency of the plaque removing (primary prevention)
- the frequency of the professional brushing (primary prevention).

A percent of 46% patients had a dental treatment (1 time/more than 5 years), and 20% had a dental treatment 1 time/year. In conformity with the norms for dental decay prevention, the frequency of dental control has to be 1 time/6 months. In our study only 14% of patients respected this frequency (Figure 7). A per cent of 30% of patients never had a plaque removing, 28% had a

plaque removing 1 time/more than 5 years and 22% 1 time/year. Only 10% of patients had a plaque removing 1 time/6 months (Figure 7). The frequency of professional brushing was almost similar with of the plaque removing, a greater percent of patients (14%) having the professional brushing 1 time/6 months (Figure 7).



**Figure 7. Patients` distribution (%) depending on the use of primary prevention (plaque removing and professional dental brushing) and on the use of secondary prevention (dental treatment) of dental decay**

## CONCLUSION

1. In the structure of the investigated sample predominated the women (62%), and the most frequent age group was the group of 15-30 years old. In the investigated dental pathology is observed a predominance of dental decay almost as high in man (58%) as in women (68%).
2. We observed in the investigated patients with dental decay the absence of prophylaxis with natrium fluoride in the first 7 years of life, a deficient hygiene of the

oral cavity (teeth brushing less than 2 times/day), deficient usage of dental floss (1-3 times/week) and insufficient usage of chewing gum before and after meals. The deficient applying of these prophylactic measures registered at the investigated sample sustains the role of the risk factors in dental decay occurring. The prophylactic measures for the dental plaque are considered absolutely necessary for dental decay prevention also, dental plaque being the main causal factor of the dental decay.

3. It is observed a decreased rate for the investigated patients referring to the early

diagnostic and dental treatment (1 time/more than 5 years – 45%), with a secondary preventive role for dental decay, plaque removing and professional brushing (1 time/more than 5 years – 28% and 29% respectively, 1 time/year – 22% for both procedures) with primary preventive role (prophylaxis) for the occurrence of the dental decay.

4. As a final conclusion of this study we can affirm that for the patients suffering from dental decay, the prophylaxis measures of dental decay were not applied efficiently, increasing the risk, and the methods of secondary prevention were not sufficient through decreased availability of population to ask examination of the dental medicine physician.

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# MONITORING OF MINERAL WATERS FOR THE CURE IN MUREȘ COUNTY

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## REZUMAT

**Scop.** Evaluarea datelor privind înregistrarea stațiunilor balneare și a strandurilor cu ape minerale balneare în funcțiune și monitorizarea compoziției apelor balneare din județul Mureș. **Metodologie.** S-au recoltat câte două probe de apă de la fiecare stațiune: prima probă în timpul sezonului de activitate (luna iulie), respectiv proba a doua în afara sezonului (luna octombrie). Parametrii fizico-chimici și bacteriologici au fost determinați în Laboratoarele Centrului de Sănătate Publică Mureș, în 2008, iar determinarea radioactivității s-a efectuat la ASP Mureș. **Rezultate.** pH-ul apelor balneare din bazinele exterioare este ușor bazic, iar cel din bazinul interior este acid. Conductivitatea și duritatea sunt în funcție de gradul de mineralizare al apei minerale balneare. Evoluția în timp a valorilor pentru nitrați, nitriți și amoniac arată valori mai crescute în probele recoltate după sezonul de activitate, în comparație cu cele din timpul sezonului de funcționare. Valoarea Pb și a Cd din apă au depășit valoarea maximă admisă. Activitatea globală beta nu a depășit valoarea admisă. **Concluzii.** Monitorizarea este necesară pentru a putea lua măsurile de prevenție în scopul eliminării eventualelor expuneri la factori de risc hidric.

**Cuvinte cheie:** apa de îmbăiere, calitatea apei, indicatori microbiologici, indicatori chimici

## ABSTRACT

**Purpose.** Evaluation of data regarding registration of the spas and mineral water resorts and also monitoring of the composition of water spas from Mures County. **Methodology.** We collected two samples of water from each station: the first one during the season of activity (in July) and the second one off season (in October). The physical, chemical and bacteriological lab tests were done in the laboratory of The Public Health Center Mures, in 2008, and the radioactivity test was performed in ASP (The Authority for Public Health) Mures. **Results.** The pH of exterior water spas is slightly alkaline, and the pH of the interior basin is acid. The conductivity and the hardness are depending on the degree of

mineralization of the mineral water spas. The evolution in time for nitrate, nitrite and ammonia values shows an increase in samples collected after the season of activity compared with those collected during the season of operation. The amount of Pb and Cd in water exceeded the maximum level allowed. The global beta activity did not exceed permissible values. **Conclusions.** Monitoring the quality of the bathing water is necessary in order to eliminate potential exposures to risk factors and to take efficient preventive measures.

**Keywords:** bathing water, water quality, microbiological parameters, chemical parameters

## INTRODUCTION

Resorts are special categories in the functional organization of Romanian urban and rural areas. Here, are deemed to be resort spas that provide full services in 35 towns and 103 rural settlements [1]. The Law of Mines no. 85/2003 [2] governing the conduct of mining activities in Romania, stimulates recovery of mineral resources and mineral water therapy. Coordination and control of the medical spas in resorts is made by the Ministry of Health in collaboration with the Ministry of Environment and Water, the Ministry of Agriculture, Forestry and Rural Development, also the Ministry of Economy and Trade, the Ministry of Transport, Construction and Tourism and the local councils of the towns in which the resort spas exists.

The use of the natural factors for therapeutic purposes is conducted on the basis of authorization issued by the Ministry of Health, based on the documentation prepared by the National Institute of Rehabilitation Medicine and Physical Balneoclimatology (NIRMPB), which is a sanitary unit with legal personality, under the order of the Ministry of Health, and is structured in the health unit with beds or ambulatory.

Medical spa units and recovery units from spas city, climatic and balneoclimatic areas, are required to obtain authorization of operation and authorization for the use of therapeutic natural factors, including operating units medical spas and recovery [3,4]. The Commission for Guidance and

Control of NIRMPB develops the indications and contraindications regarding the value of therapeutic mineral waters by conducting a systematic and complete pharmacodynamic study. This study includes the evaluation of physical, chemical and microbiological laboratory tests performed of INRMFB. If the Commission considers that the therapeutic natural substances do not meet the requirements of assessment-reassessment provided in these rules, the competent authority has the power to shut down the usage of the resource throughout Romania [5]. It is necessary to install sanitary protection areas around the fields of mineral water used for intern cure or for bottling, for bottling plants and operating sludge treatment, also for lakes and sludge treatment [6].

## OBJECTIVES

- evaluating data on registration of the spas and mineral water basins running spas
- spa's water monitoring in Mures county
- the evaluation of data concerning the quality control of the resort waters used for bathing in the Mures area.

## METHODOLOGY

### *Resort description of Mures County*

#### *1. The Sovata Resort, Bathing basin Bear Lake*

The Sovata Resort has been known during the Roman Empire's period of time. The



Bear Lake (18.4 m depth) was formed on the ruins of a salt mine, showing heliothermal phenomena (in the summer, water temperature varies with the accumulation of solar heat in salted water and hot water is protected by a layer of fresh water from rill not to be mixed with salted water, but remains on the surface, acting as an insulator). This makes the summer temperatures to vary between 10-20°C on the surface, 30-40°C at a depth of 1 m and 40-60°C at a depth of 1.5 m. The beach of the Bear Lake is arranged recently, using as construction material wood, with individual rooms, toilets and showers with fresh water.

#### *2. The physiotherapy spa Sângeorgiu Mureș (PSSM)*

The resort „Salt bath Sângeorgiu Mureș”, is known since 1880, recently being named “The physiotherapy spa Apollo Hotel”. Salted water, extracted from the 3 wells drilled to 800-950 m, presents an exceptional mineralization. As construction materials were used concrete and wrong, with good looking conditions and recreational services. There are two pools, one indoor and another one outdoor with mineral water. Here it is used also mud for therapy. Salted baths are equipped with locker rooms, toilets and showers with fresh water. Also the resort provides medical assistance for patients.

#### *3. The treatment and recovery resort Ideciu de Jos*

The station has recently been renewed with private alleys, equipped with individual lockers, toilets and showers with fresh water. The sources of mineral water resort are: two dug wells, 5 m and 6 m deep, from which the resort gets pumping water in tanks. There are 3 pools outside built from wood (2 for adults and 1 for children), which are not bounded between them. The resort has a seasonal nature: from the first of

July to the first of September. For the patients there is not medical assistance here, but the village has a medical dispensary.

#### *4. The salted baths Jabenița*

This resort was constructed in 1997, it is now privately owned, with 3 external tanks constructed of wood (2 for adults and 1 for children) that are not bounded strictly between them. Mineral water resort runs from spring through fall. Mud is collected in a wooden barrel. The salted baths are equipped with locker rooms, toilets and showers with fresh water. Activities are seasonal, July-September.

#### ***Sampling of bathing water resort***

Water samples were collected pursuant to standards: SR. ISO 5667-4:2000, SR EN ISO 5667-3:2004 EN ISO 5667-1:2007 [7,8,9]. There were collected two samples from each station: the first sample during the season of activity (July) and the second sample off season (October).

#### ***The methods of analysis used***

The physical, chemical and bacteriological tests were performed in the laboratory of the Center for Public Health Mureș, according to STAS and ISO in force during 2008. Determination of radioactivity was performed in accordance with ASP Mureș County STAS 11598-83 [10].

## **RESULTS AND DISCUSSION**

Water flow springs resorts for bathing in the river are not known.

Organoleptic indicators are specific for water spas.

Physical and chemical indicators are presented in Table 1.

**Table 1. The physical-chemical water spas parameters compared with the maximum permitted levels for natural mineral water**

Parameters monitored	Date of sampling	Values of parameters				Admitted values
		Sovata Lake	Inside basin Sâng. M	Outside basin Ideciu de Jos	Outside basin Jabeșița	
pH	07.07.2008	8,113	7,128	8,053	8,233	Compliant to natural status
	0.6.10.2008	8,01	6,57	8,40	7,93	
Conductivity $\mu\text{S}/\text{cm}$ to 20°C	07.07.2008	69.700	155.80	98300	52100	Fitting mineralization
	0.6.10.2008	68.500	166.000	93300	55800	
Sulfates mg/l	07.07.2008	48,00	62,90	240,0	22,00	Fitting characteristics
	0.6.10.2008	275,8	15,18	470,2	90,35	
Ca mg/l	07.07.2008	206,68	1614,8	293,57	161,85	Fitting characteristics
	0.6.10.2008	372,07	1199,99	1311,72	175,65	
Mg mg/l	07.07.2008	21,66	1618,0	43,07	12,29	Fitting characteristics
	0.6.10.2008	17,41	1941,30	21,35	18,85	
K mg/l	07.07.2008	2,91	15,33	5,08	3,95	Fitting characteristics
	0.6.10.2008	<LD	16,91	<LD	2,53	
Hardness (grade germ)	07.07.2008	24,68	1279,08	49,37	17,95	No permitted level specified
	0.6.10.2008	40,39	1077,12	42,63	17,95	
Nitrates mg/l	07.07.2008	0,00	16,70	0,00	0,00	50
	0.6.10.2008	13,20	10,40	10,40	14,60	
Nitrites mg/l	07.07.2008	0,02	9,00	0,08	1,09	0,1
	0.6.10.2008	0,33	0,28	0,24	1,4	
Ammonium mg/l	07.07.2008	0,3	152,30	2,20	3,1	0,5 (1); 5 (2)
	0.6.10.2008	0,20	139,00	11,10	6,10	

The pH water spas - is slightly alkaline excepting the mineral water spas from the inside basin of BTB Sângeorgiu Mures.

Conductivity and hardness - had the most elevated values in the mineral water from PSSM Sângeorgiu Mures, in the season of activity.

Indicators:

Ca, Mg and K - have not limits for water resort [11], their value depending on the source of water.

Nitrates, nitrites and ammonia - had the highest values (16.7 and 152.3 with 9 mg/l) in waters of the inside basin PSSM Sângeorgiu Mures during the season of activity. The evolution in time of the values of these indicators in mineral water spas of outdoor pools from the salted Jabeșița Spa, Ideciu de Jos and the Sovata spa shows an increase in the off season period, values being higher than during the season of activity, meaning that these mineral spas are loading with organic substances during the activity period, materials which decompose over the time. In the pool of water inside the resort Sângeorgiu Mures PSSM the values

of these parameters show a reverse situation related to the fact that the water from the interior basin changes regularly.

*Toxicological indicators* are presented below (Table 2)

**Table 2. Comparison of toxicological parameters of mineral water from spas with the maximum level permitted for natural mineral water**

Parameters monitored	Date of sampling	Values of parameters				Admitted values GD 1020/2005 Natural mineral water
		Sovata Lake	Inside basin Sâng. M	Outside basin Idecu de Jos	Outside basin Jabeșița	
<b>Toxicological parameters</b>						
Arsenic mg/l	07.07.2008	<LD	<LD	<LD	<LD	0,01 mg/l
	0.6.10.2008	<LD	<LD	<LD	0,0019	
Lead mg/l	07.07.2008	0,072	0,041	0,069	0,058	0,01 mg/l
	0.6.10.2008	<LD	0,207	0,027	0,034	
Zinc mg/l	07.07.2008	0,521	0,329	0,486	0,371	5 mg/l
	0.6.10.2008	-	-	-	-	
Copper mg/l	07.07.2008	0,216	0,335	0,248	0,167	1 mg/l
	0.6.10.2008	0,043	0,959	0,048	0,069	
Mercury µg/l	07.07.2008	<0,1	<0,1	<0,1	<0,1	0,001 mg/l
	0.6.10.2008	0,66	0,78	0,85	2,85	
Cadmium mg/l	07.07.2008	0,021	<LD	<LD	<LD	0,003 mg/l
	0.6.10.2008	0,009	0,031	0,010S	0,0045	
<b>Organic pesticides</b>						
α -HCH µg/l	07.07.2008	0,0024	0,0054	0,0060	0,0043	0,1 µg/l
	0.6.10.2008	0,0033	0,0143	0,0029	0,0024	
β -HCH µg/l	07.07.2008	0,0012	0,0076	0,0073	0,0021	0,1 µg/l
	0.6.10.2008	0,0019	0,0037	0,0002	0,0008	
γ -HCH µg/l	07.07.2008	0,0036	0,0083	0,0074	0,0032	0,1 µg/l
	0.6.10.2008	0,0042	0,0575	0,0039	0,0025	
δ-HCH µg/l	07.07.2008	0,0040	0,0302	0,0178	0,0034	0,1 µg/l
	0.6.10.2008	0,0081	0,0344	0,0059	0,0174	
Total HCH µg/l	07.07.2008	0,0112	0,0513	0,0385	0,0130	0,5 µg/l
	0.6.10.2008	0,0175	0,1094	0,0129	0,0230	

Water may contain chemicals with different toxic actions on the body. There are considered toxic substances those substances which have a well-known action in this regard and influence us in relatively low concentrations [12]. From the tested toxicological indicators (As, Zn, Cu, Hg, Pb, Cd) only levels of Cadmium and Lead exceeded the maximum permissible concentration at all the monitored points. Pesticides concentrations were below the limit allowed.

#### *Radioactivity parameters* [11,13]

According regulation 1020 from 2005, global beta activity (only this value being determined) of mineral water spas in the Bear Lake was 0.0896 Bq/dm<sup>3</sup>, in the inside basin of PSSM Sângeorgiu Mures was 0.4707 Bq/dm<sup>3</sup>, in the water from the outside basin of Jabeșița Spa was 0.1213 Bq/dm<sup>3</sup>, also in the Idecu de Jos resort was 0.1561 Bq/dm<sup>3</sup>, meaning that all the points monitored have not exceeded the maximum level permitted.

#### *Microbiological indicators* (Table 3)

**Table 3. Comparison of the microbiological indicators in the water spas with the maximum permitted levels for natural mineral waters**

Parameters monitored	Date of sampling	Values of parameters				Admitted values
		Sovata Lake	Inside basin Sâng. M	Outside basin Ideciu de Jos	Outside basin Jabeșița	
CFU at 22°C/ml (Colony Forming Units)	07.07.2008	1275	1600	780	235	GD 1020/2005 Natural mineral water 20 (at source)
	0.6.10.2008	7000	0	1873	2422	
CFU at 37°C/ml	07.07.2008	1040	1550	1210	194	5 (at source)
	0.6.10.2008	2623	0	673	19250	
Escherichia Coli nr/100 ml	07.07.2008	0	0	0	180	absent/250 ml (at source)
	0.6.10.2008	260	0	0	5700	
Coliform CFU no /100ml	07.07.2008	800	80	3000	180	-
	0.6.10.2008	400	0	0	5700	
Streptococcus faecalis CFU (Enterococcus) nr /100 ml	07.07.2008	0	0	1200	0	absent/250 ml (at source)
	0.6.10.2008	191	0	609	2900	
Pseudomonas aeruginosa /100 ml	07.07.2008	2100	1000	3200	1800	absent/250 ml (at source)
	0.6.10.2008	3100	0	6900	7800	

Mineral waters at source are characterized by a specific micro flora whose composition is dictated by the physical and chemical characteristics of the water and the origin and the environmental factors that interferes with the water source [14,15].

*The Colony forming units (CFU) at 22°C and at 37°C*, from the mineral water spas for the Bear Lake, the PSSM Mureș Sângeorgiu and the outdoor pools at the Spa Jabeșița have exceeded the maximum level permitted. In the water sample collected on 06.10.2008 from the inside basin at Sângeorgiu Mures both parameters were zero. The report between the CFU developed at 22°C and the CFU at 37°C in most cases is not observed because of increased colony units developing at 37°C.

*Escherichia coli* is present in the water resorts of Lake Sovata (in the sample of water gathered on 06.10.2008, extra-season) and in the mineral water from the outside pool of Jabeșița resort (both samples from the season and off season).

*The Coliform* CFU has no limited levels according to GD 1020/2005 [11], and are present in most samples collected from the

water resorts, with large variations in the numbers from 0 to 5700, with predilection for bathing season.

*The Faecal streptococci* CFU are present in samples of water collected from the Bear Lake (on 06.10. 2008), in the outside basin of Ideciu de Jos (dated 07.07.2008 and 06.10.2008) and from the outside basin Jabeșița (dated 06.10 .2008). The trend of faecal streptococci in the water samples of Jabeșița, Ideciu de Jos and Lake Sovata show increased levels for the activity period compared with the off season period, which indicates that these mineral spas are contaminated with faecal streptococci during their use by the population.

*Pseudomonas aeruginosa* was detected in most samples of mineral water resorts tested. Just as with the streptococcus, spa's waters are also contaminated with *Pseudomonas* during their use. Note that in the sample of mineral water resort tested on 06.10.2008 from the basin of Sângeorgiu Mures, all bacteriological indicators showed null values.

*Therapeutic indicators* (Table 4)

**Table 4. Comparison between the bacteriological parameters of water spas with accepted values for natural mineral waters**

Parameters monitored	Date of sampling	Values of the parameters			
		Sovata Lake	Inside basin Sâng. M	Outside basin Ideciu de Jos	Outside basin Jabenita
Sulphides mg/l	07.07.2008	0,00	0,01	0,002	0,009
	06.10.2008	0,562	0,562	0,046	0,003
Iodides mg/l	07.07.2008	2,62	15,76	2,13	3,15
	06.10.2008	0,80	14,07	1,07	0,67
Fluorides mg/l	07.07.2008	0,06	0,13	0,12	0,09
	06.10.2008	0,116	0,115	0,100	0,100
Chlorides mg/l	07.07.2008	26529	99960	46920	20400
	06.10.2008	306700	106080	42840	26520

In our case, the results obtained in our laboratory led to the following interpretations:

The highest levels of Iodine and Fluorides were found in the mineral water resort of PSSM Sângeorgiu Mures (15.78 mg/l respectively 0.13 mg/l). The highest Chloride concentration was found in the mineral water resort of The Bear Lake Sovata (306,700 mg/l), followed by the mineral water resort of PSSM Sângeorgiu Mures (with 106,080 mg/l).

The special Committee of The Ministry of Public Health, with consulting of National Institute of Rehabilitation and Physical Balneoclimatology set for each spa, depending on the therapeutic properties of the natural factors in the area, the treatment profile for the types of cure, the categories of problems indicated, contraindicated conditions, and the minimum endowment of spa-physical treatment and recovery needed.

#### *Materials used for building the swimming pools*

In the outdoor pools and the Bear Lake, the construction material used is wood, and in the inside basin of Sângeorgiu Mures resort the construction material used is cement and wrong [16].

#### *Controlling the bathing water parameters*

*a. Surface water sources used for bathing.* The County public health ensure monitoring of the bathing water parameters, based on the methodology provided by the Government Decision no. 546 of 2008 and establish a monitoring calendar for each bathing area before the start of each bathing season.

*b. Bathing basins with freshwater for recreation* are supplied with drinking water, and the monitoring of their quality parameters is carried out by The Health Inspectorate, based on Law No. 311/2004 of drinking water [17].

*c. The mineral water spas of treatment ponds or swimming resorts and treatment basins* comes from mineral springs, also from drilling of great or small depth. The quality of spa's waters must correspond to regulation 1020/2005 [11].

After using these waters for therapeutic purposes or for recreational swimming pools, the spas water quality decreases, especially in the germ levels. How to change the water from the treatment pools or the common pools is not, unfortunately, regulated by law. Currently, water quality monitoring is performed by the Romanian National Institute of Rehabilitation, Physical Medicine and Balneoclimatology and not by the State Sanitary Inspectorate, which is the most appropriate organ for the control

and prevention of the population' diseases [18].

The source of bathing water in the swimming pools is the drinking water that comes from the water plant. The bathing water in swimming pools is under the health control of the Law no. 311/2004 [17], and the control of the bathing water in swimming pools is performed by the State Sanitary Inspection. The source of water for the Water Resorts is the mineral water provided either by drilling of deep wells or from water stationary surface, lakes (The Bear Lake Sovata). These spa's waters (used by the population) at the source are considered appropriate in terms of bacteriological and toxicological parameters.

Once the water gets into the swimming pools the water quality is no longer controlled. During the season the resorts pools of water are used by many people for either treatment (persons with acute illnesses, especially chronic), or for recreation. The degree of microbial load of the water resort is correlated with the number of people who have been in this water bath. Salted water has a bactericidal effect which depends on the concentration of NaCl, but this form of monitoring gives users safety.

In the basins water quality monitoring is done through periodic collection of water samples and the determination of water quality, collected by a scheme established by law. Also there is a well established program for changing the river water.

The analysis of samples of water resort shows that the parameters during the season of activity should be monitored. Monitoring is necessary for taking preventive measures in order to eliminate potential exposures to risk factors [19,20]. In case of water spas or swimming pools, the water quality monitoring is left on account of those who are operating the resorts. If low flows of

water resort source of this exchange is done with deficiency or incomplete.

## CONCLUSION

- The pH of the spas water from the outside basins is slightly alkaline, and from the inside basins is acid.
- The conductivity and the hardness are depending on the degree of mineralization of the mineral water spas.
- The evolution over time of the values for nitrates, nitrites and ammonia in the mineral water spas and the outdoor pools of Sovata shows increased levels in samples collected after the season of activity comparing with those collected during the season of operation.
- The amount of Cd and lead in the mineral water resort of Bear Lake has exceeded the maximum level allowed.
- The pesticides had concentrations below the maximum level permitted.
- The global beta activity in mineral water spas has not exceeded permissible levels.
- We detected the presence of *Escherichia Coli* and faecal streptococci in the mineral water resort from outside and on the Bear Lake, but we have not detected any of this in the water resort inside basins.
- The degree of loading with *Pseudomonas aeruginosa* in the water of the outside basins is higher after bathing season than outside the bathing season.
- We noticed the lack of information regarding the flow of springs or boreholes for the water used for the bathing resort.

### Recommendations:

- Due to the fact that the mineral water basins for

bathing are used more and more for recreational purposes, much like the swimming pools, there have to be imposed the same hygienic and sanitary measures as for the swimming pools, for the prevention of water related diseases.

- It is necessary to compile a supervision and control guide for the quality of the bathing spas water.
- It is necessary to organize an individual schedule for changing the mineral spa water from the basins.

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# BACTERIOLOGICAL RISK FOR MEAT AND MEAT DERIVATES AND THE REDUCTION OF THE RISK FOR HEALTH

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## REZUMAT

*Indicatorii bacteriologici reprezentați de bacteriile coliforme, E. coli, bacteriile sulfitoreducătoare, B. cereus, Salmonella și Staphylococcus aureus semnifică contaminarea fecală, microorganismele fiind reprezentate în intestinul omului și al animalelor. Exceptând bacteriile din genul Salmonella care sunt patogene pentru om și animale, celelalte bacterii sunt condiționat patogene. Reducerea riscurilor biologice se referă la monitorizarea continuă a unităților alimentare prin autocontrol și inspecție sanitară.*

**Cuvinte cheie:** indicatori bacteriologici, carne, reducerea riscurilor

## ABSTRACT

*The bacteriological indicators represented by coliform bacteria, E. coli, the sulfate - reducing bacteria, B. cereus, Salmonella and Staphylococcus aureus are indicating the feces contamination, the microorganisms being represented in human and animal intestine. Excepting the Salmonellas, which are human pathogen, the other bacteria are conditioned pathogen. The risk reduction refers to continuous monitoring of the food industry by self-control and by sanitary inspection.*

**Keywords:** bacteriological indicators, meat, risk reduction

**Coliform bacteria** reunite the microorganism high spread in human environment, which are able to ferment the lactose in culture at 35 - 37°C.

The coliform bacteria include:

- thermotolerant coliform bacteria which belong to the normal flora of the intestine and ferment lactose at 44-45°C: E. coli, the main bacteria in normal intestinal flora, Klebsiella, Enterobacter, Citrobacter;

- microorganisms from a rich in organic nutritive substances from the environment (waters with excess organic substances, fertile soils, putrefaction plants: Enterobacter cloacae, Citrobacter freundii, etc. [1].

By raising the pathogen potential conditioned pathogen thermotolerant coliform can determine intestinal infections.

*The contamination risk for the meat* is possible on the entire processing circuit from raw material and auxiliary products to final product.

**Escherichia coli** (Family Enterobacteriaceae, Genus Escherichia) is widely spread in the environment from the intestine of humans and animals through the feces. Escherichia coli belongs to the normal intestinal flora of humans and animals, representing 80% of the flora, with role in biocenosis and the synthesis of vitamins B and K. the number of Escherichia coli per measure unit of water and foods represents the favorite indicator of feces contamination.

Escherichia coli is conditioned pathogen. The pathogen potential is linked to the multiplying and toxinogenesis. The enteral infections are produced by Escherichia coli Enterotoxigenic, Enteroinvasive, Enterohaemorrhagic, Enteroaggregative. The extra-renal infections urinary, neonatologic, nosocomial, genital, and sepsis are usually endogenous.

*The contamination risk for the meat* is possible on the entire processing circuit. The source of infection can be animal (intravital contaminated meat of cattle from the intestinal content) or human. The isolation of Escherichia coli from food, water, working surfaces is the election test for feces contamination [3].

**The sulfate - reducing bacteria** are represented by Clostridium perfringens. Clostridium perfringens (Bacillaceae Family, Genus Clostridium) is an anaerobic bacillus, spore-forming, that can be found on soil, human and animal intestinal tract, on the surface and intestinal tract of diptera. Clostridium perfringens is conditioned pathogen and is associated to food-borne illness when the food contains a large number of bacilli (millions/gram). Clostridium perfringens is the third cause of food-borne illness after Salmonella and Staphylococcus aureus. The most frequent

types involved in food poisoning are: type A thermoresistant D and F [4].

**Bacillus cereus** (Bacillaceae Family, Genus Bacillus) is aerobic, spore-forming, wide spread in nature, soil, and water. It is found in the healthy humans and animal intestinal tract. Bacillus cereus is conditioned pathogen. After multiplying in aliment it can cause food poisoning. Factors of pathogenesis are large numbers (at least a million), thermolabile enterotoxin, cereulizin (haemolizin), phospholipase C, etc [5].

*The contamination risk for the meat*

The feces and soil massive contamination of food, raw material and condiments followed by the thermic preparation that is not destroying the spores, and then the cooling to room temperature allows the spores to germinate, multiply and to produce toxins. The food is suffering modification due to biogenic amines resulted through proteolysis. Quick refrigeration after thermic preparation prevents the germination of the spores, the multiplication and the toxins synthesis.

**Salmonellas** (Enterobacteriaceae Family, Genus Salmonella) are very wide spread in nature, water, soil. Their habitat is in the intestinal tract of human and animals. The insects are vectors.

Salmonellas are pathogen for human and animal. The different serotypes are producing different diseases. Minor salmonellosis, especially food poisoning are caused by Salmonella typhimurium, Salmonella enteritidis, Salmonella cholerae suis, animal pathogens transmitted from animal to human through contaminated food. Typhoid fever is caused by Salmonella typhi, Salmonella paratyphi A, B, C and is affecting also the human. The way of transmission is from feces – oral by contaminated water and food. The pathogenic factors are endotoxin, the invasive, factors involved in the resistance

to phagocytosis, factors involved in the resistance to acid pH, the virulence antigen.

#### *The contamination risk for the meat and meat products*

The domestic and wild animals represent the natural reservoir of salmonella and the principal sources of infection and the pigs are the primary source. The risk is growing when the animals are having unapparent infections (25% of the infected pigs). The serotypes most frequent isolated from the pigs are: *Salmonella cholerae suis*, *Salmonella typhimurium*. The cattles are less contaminated in comparison with the pigs, and the serotypes more frequent are: *salmonella typhimurium* and *Salmonella enteridis*. The mincemeat, the organs, the meat products are the most important way of remittance in food poisoning with salmonella. The mice from the production units are important sources of transmission. The human source can be the sick person or the healthy carrier. The frequency of the healthy carriers is up to 1% from the general population (especially women with billiar-hepatic disease) and up to 30% in the slaughter-house.

The contaminated food does not modify the organoleptic proprieties. The contamination can be primary, in vivo (ill animals or carriers of *Salmonellas*) or secondary, more frequent through urine, excrements of ill animals, contaminate water, vectors [5].

**Staphylococcus aureus** (Fam. Micrococcaceae, Genus *Staphylococcus*) is wide spread on the teguments and mucous membranes of humans and mammals. It is one of the most resistant bacteria due to the enzymes and toxins produced.

*Staphylococcus aureus* is conditioned pathogen and is important in human pathogenesis when is in large number and crosses the natural human barriers. The staphylococci infections are: food poisoning when the food was contaminated with the staphylococci enterotoxin. The exotoxin and

enzymes more important are: coagulasis secreted by *S. aureus* that has value of virulence marker; 6 enterotoxins; hemolizins, hialuronidasis, lipasis, B-lactamasis.

#### *The contamination risk for the meat and meat products*

The human reservoir is primordial: patients with staphylococci dermal infections (piodermatitis, furuncles, abscesses), upper respiratory tract (pharyngitis, sinusitis); intestinal; the healthy carriers nasal-pharynx or/and intestinal, 20-30 % of general population, dermal (transitory), 5-10% [6].

The meat and meat products can be contaminated on the circuit of processing from the personnel described as source. *Staphylococcus aureus* can resist up to 42 days in carcasses, 60 days in processed meat. Once the food was contaminated it offers the environment to the multiplying and the producing of toxins if the food is kept at the room temperature. The contaminated food does not modify the organoleptic proprieties. The factors that deters the production of exotoxins: acid pH, refrigeration and freezing. *S. aureus* is destroyed at boiling temperature and the toxins are destroyed at 100°C for 30 minutes. The infected milk-producing animals can be sources of infection and the meat is infected in vivo [7].

#### **The reduction/elimination of the bacteriological risks from meat products**

- raw materials with low microbial load
- auxiliary materials with microbial load in concordance with hygienic requirements
- the proceedings of the slaughtering and processing of the meat with minimal bacteriological contamination
- operative healthy personnel, that graduated the periodic fundamental courses for hygiene

- continuous monitoring of the food industry by self-control and sanitary inspection
- the establishment of self-control and sanitary inspection efficacy: the

increase the bacteriological quality of the meat products [8-12].

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# THE BRAZELTON NEONATAL BEHAVIORAL ASSESSMENT SCALE (NBAS)

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## REZUMAT

*Scala Comportamentului Neonatal -Neonatal Behavioural Assessment Scale (NBAS)- a fost concepută inițial de către Dr. Berry Brazelton și Dr. Kevin Nugent, pentru a fi folosită ca instrument de cercetare, însă acum este folosită din ce în ce mai mult drept metodă de intervenție, ca mod de a facilita această primă și crucială relație care este atașamentul mamă-copil. În timpul administrării NBAS, părinții sunt încurajați de operator să observe comportamentul copilului lor: capacitatea lui de a se autoregla și a se calma, de a se apăra de stimulii disturbatori din exterior (de exemplu, lumina sau sunetele prea puternice care îi pot deranja somnul), abilitatea de a distinge vocea mamei de vocile altor persoane, capacitatea de a transmite părinților când are nevoie de stimulare sau din contră, de somn. Aportul pe care îl aduce administrarea Scalei Comportamentului Neonatal în relația mamă-copil este acela că: 1. crește încrederea mamei în ea însăși și în capacitățile de reacție a copilului ei; 2. îmbunătățește atitudinile tatălui și implicarea acestuia în îngrijirea sugarului; 3. influențează pozitiv reciprocitatea în interacțiunile mamă- copil; 4. influențează pozitiv (prin toate cele de mai sus) dezvoltarea mentală a copilului.*

**Cuvinte cheie:** evaluare neo-natală, scala Brazelton, atașament post-natal, dezvoltare

## ABSTRACT

*The Neonatal Behavioural Assessment Scale (NBAS) was originally designed by Dr. Brazelton and Dr. Nugent as a tool for clinical research but is now increasingly being used as a way of facilitating this first and most crucial relationship. During an Assessment, parents are encouraged to observe their baby's many abilities, such as the ability to self-soothe, to block out disturbances during sleep such as noise or harsh light, to distinguish the sound of their parent's voice from all other voices, to let their parents know when they want stimulation and when they want sleep. Studies have shown that the NBAS: 1. increases maternal self confidence; 2. improves paternal attitudes and involvement in caretaking; 3. influences reciprocity in mother-infant interaction; 4. influences a baby's developmental outcome.*

**Keywords:** Attachment, development, Brazelton Scale, neo-natal behaviour

Evaluation of new-born and small child took part of the long routine pediatric practice. The neonatologist is one who makes the first assessment of the child immediately after birth by calculating the Apgar score that reflects the child estate evaluating with a note from 1 to 10. Calculation of the score is done by adding points (0=none, 1 = satisfactory, 2 = best) assigned to each of the following: skin color, breathing, heart rhythm, muscle tone and activity. This is an assessment of capacity to meet baby labor difficulties, birth and the new environment. As such, this score does not predict the future health of children but reflects more what he has faced during birth. This first assessment is done the first time right after birth and then after a few minutes, to compare the two scores and results to illustrate the ability of adapting the child to its new environment. In our country, Apgar score is unfortunately the only "test" which is performed to the new-born out of the assessment of physical and functional which is noted in the record - sheet at the mother's discharge from maternity.

Neonatal Behavior Assessment Scale (NBAS), which we will call further as Brazelton Scale, is a tool designed to assess what kind of person is the new-born child. It assesses the baby's behavioral repertoire in response to human stimuli and non-human, and how the state of consciousness (casual or deep sleep, drowsiness, feeling alert and complained irritation) affect responses and vice versa-the ability to reveal to adapt to new environment. Have passed more than fifty years since it was developed this tool through which experts in the field of neonatology, psychologists and parents (- who have witnessed the application of Brazelton Scale to their babies) understand and have gradually integrated the idea that the baby is a little being, competent to cope with all requests to the new environment must adapt once out of the uterine environment in which he spent the nine months of pregnancy. Past ninety years, Dr.

Brazelton (he visited us in the autumn of last year in Bucharest, answering the invitation Generația Foundation to launch his volumes: From birth to three years (vol.1) and From three to six years (vol.2) - Emotional and behavioral development of your child) not cease to be surprised of the newborn activeness and fullness of resources.

When the baby has to face internal and external incentives, either for that is sufficiently robust equipped for this, either because the intensity of stimuli is tolerable, it may perceive these stimuli, and to integrate and respond in turn to use them to adapt to the environment. If we take the example of maternal voice, it will be perceived by the new-born (this time through the air, not trough abdominal walls, uterine and aquatic environment of the uterus like antenatal period) and will in turn be manifested by a response orientation towards the mother, which will dazzle his mom but it will bring the two into a genuine dialogue! Conversely, if the baby is assaulted by stimuli that pass over the threshold of tolerance such as cramps, pain, etc. or internal excess noise, light and other external stimuli, it loses its ability to react appropriately, its behaviors turns in play defense and protection. If we think at the techniques we have learned from adult psychotherapy of stress and how to proceed with this release and learn to manage stress so that it does not pass the threshold of tolerance and he enters the coping mechanisms, we can make an idea as Brazelton Scale works as a way to put in a new light little creature in the eyes of her parents but also in the eyes of professionals who should adjust their attitudes when they have to deal with painful medical treatments, when they send away the parents when the child is ready for surgery, or simply when they separate soon after birth the new-born of his mother.

Unable to speak, the newborn baby communicates by doing things: looking

wide awake and interested, turning away, yawning, sneezing, screwing up his or her face and, of course, crying. The NBAS is a way of sharing and understanding this behaviour for new parents. If parents can observe the newborn's reflexes and understand their ability to habituate (shut out disturbing stimuli when asleep), regulate their sleep and wake states and self-soothe, it can help the parents respond appropriately.

The NBAS demonstrates an infant's strengths, helping parents and professionals to develop caretaking strategies. It is based on the positive model of parenting and child development – rather than the medical model, searching for deficits.

With the parents present, the Assessment is carried out on an infant halfway between feeds by an NBAS trained professional experienced with newborns. It takes approximately half an hour to carry out at any point from birth until the baby is two months old. Ideally, the exercise is repeated three times in the first month, which gives both parents and professionals a chance to identify the baby's strengths and areas of difficulty. Caregiving strategies are shared with parents. The intervention is also used to assess the effect of inter-uterine deprivation or maternal substance misuse on the baby, and is used to support parents of babies born prematurely, or with congenital abnormalities, or Down syndrome.

Babies come into the world ready for relationships, utterly dependent on the loving care of their families. Yet they also arrive at a time when many parents have never even seen, let alone held, a new baby. For absolute beginners, the first few weeks of parenthood can be a steep learning curve; its 24-hour demands can threaten to overwhelm some couples, many of whom have little family support today.

The time of greatest influence, for good or ill, is when the brain is new. If we want to

help the next generation, we should be working with their parents while they are babies. Now that the birthrate is decreasing, and fewer and fewer new parents have ever encountered a baby before, the Neonatal Behavioural Assessment Scale is arriving at just the right time.

Studies have now established that babies can recognise voice and smell of their mother at birth. At four days old, they can distinguish between their mother's face and other faces and they can even recognise emotional expressions. Infants are primed from birth (and earlier) to interact with their caregivers.

Now brain imaging has confirmed what was previously suspected: 'the prime task of brain development in the first few weeks of life is the forming and then reinforcing into permanence of necessary connections. The baby must interact with a loving and responsive environment in order to ensure normal brain growth.

The Neonatal Behavioural Assessment Scale (NBAS) was originally designed as a tool for clinical research but is now increasingly being used as a way of facilitating this first and most crucial relationship. During an Assessment, which lasts about 30 minutes, parents are encouraged to observe their baby's many abilities, such as the ability to self-soothe, to block out disturbances during sleep such as noise or harsh light, to distinguish the sound of their parent's voice from all other voices, to let their parents know when they want stimulation and when they want sleep.

Studies have shown that the NBAS increases maternal self confidence improves paternal attitudes and involvement in caretaking influences reciprocity in mother-infant interaction and influences a baby's developmental outcome [1-5]. The NBAS is used in research studies and as a supportive intervention.

Currently, Brazelton Scale applies on all continents. There are 17 Centres worldwide where Health Professionals can be trained. In Europe there are 9 centers Brazelton: in England, Sweden, Denmark, Belgium, Switzerland, France, Italy, Spain, Portugal and hopefully soon in Romania. In this respect Dr. Nadia Bruscheiler-Stern, director of the Brazelton Center Geneva,

Switzerland, has ensured that we will have all concours in this project for Romania that we started after we had participated in courses organized by Brazelton Centre in Geneva. The Brazelton Centre in Romania aims to encourage health professionals working with babies to train in the NBAS and therefore adopt a powerful way of working with parents.

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# THE PUBERTY MATURATION AND SEXUAL BEHAVIOR ELEMENTS IN ADOLESCENCE

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## REZUMAT

*Efectele maturizării sexuale își pun amprenta asupra adolescentului. Comportamentul sexual este un complex fizic, psihic și emoțional. Modul în care o persoană se manifestă sexual depinde de educație și cultură, de mediul de proveniență, de anturaj, credințe și convingeri de natură laică și religioasă. De aceea, normalitatea sexuală are limite foarte largi de o parte și de alta a medianei la care se face raportarea, tocmai pentru a sublinia diferențele interumane. În încercarea de a interpreta un comportament sexual, este nevoie de o conlucrare între biologie, medicină și psihologie.*

**Cuvinte cheie:** adolescent, comportament sexual, normalitate sexuală

## ABSTRACT

*The outcomes of sexual maturation hallmark the adolescent. The sexual behavior is an intricate of physical, psychical and emotional components. The way a person behaves sexually depends on education and culture, on the environment of origin, the entourage, believes, both of laic and religious nature. This is the reason the sexual normality varies largely around the medium we report to, by this token underlying interhuman differences. In trying to interpret a sexual behavior there is needed an interrelation between biology, medicine and psychology.*

**Keywords:** adolescent, sexual behavior, sexual normality

The outcomes of sexual maturation hallmark the adolescent by their psychological impact. Every child has an internal pattern of what it is "normal" or "right" to happened to him once the puberty starts, and also about the moment when he has to traverse all the physical changes this time of life implies. All the bigger is the discrepancy between what he thinks he is supposed to experience and the things happening to him

in reality, the psychological impact of these changes is greater. One of the biggest paradoxes of the adolescence is the fact it exists a continuous fight between the wish to be "one's self", to find one's identity, and the wish to be more alike your friends. Anything that might take away the adolescent of its group of friends has negative outcomes, and this is the reason why young people are often troubled by a

too quick or too slow sexual maturation, which they catalog and feel as being abnormal [1].

The sexual behavior is an intricate of physical, psychical and emotional components. These components influence each other, and to discuss every one separately gives way to possible misbeliefs. The way a person behaves sexually depends on education and culture, on the environment of origin, the entourage, beliefs, both of laic and religious nature. This is the reason the sexual normality varies largely around the medium we report to, by this token underlying interhuman differences. In trying to interpret a sexual behavior there is needed an interrelation between biology, medicine and psychology [2,3].

Along with the increase in the age for marriage, there is also an increase in opportunities to develop before marriage friendships, dates, and also more serious partnership relations between young men and women. Case studies explored the partners for date of young people, and the findings suggest a considerable cultural variation. Dates are practiced by a large proportion of the young people, although not regularly. Usual locations for dates include cinemas, discos, bars and karaoke bars. Dates do not involve sex for the majority of young people. Young men have more opportunities for sexual experimentation, up against girls. The age for sexual debut is smaller for men than for women. The sexual debut takes place more frequently in the person's own home [4-6].

In the USA, in the year 1991 The YRBSS Project (Youth Risk Behavior Surveillance System) was created for examining behaviors presenting risk for health, behaviors influencing mortality, disabilities and social problems in adolescents and young people in USA, including sexual behavior.

The results of the YRBSS 2005 study, across 35 states, on a sample consisting in 13917 high school students from 9th to 12th grade, from both public and private schools, presenting a response rate of 67%, using an anonymous and self administered scannable questionnaire, put forth:

- 46.8% of the students already had sexually relations, 46.7% girls and 47.9% boys
- 33.9% are sexually active (one or more partners in the last 3 months before answering the questionnaire), 34.6% girls and 33.3% boys
- 6.2% high school students had intercourse before the age of 13, 3.7% girls and 8.8% boys [7].

The relations with multiple partners were analyzed in a serial of case studies, but the results are not comparable, due to the variation of the reference periods, from 12 months before the studies, in several cases, up to measures on the whole life period, in the majority of cases. In spite of all these, the results indicate high percents of sexually active young people were involved in sexual relations with more than one partner. Young men have a greater probability than women to report the existence of multiple sexual partners. Young women have higher probability than men to present sexual relation to a stable partner [8-11].

The results of the YRBSS 2005 study show 14.3% of the high school students had intercourse with 4 or more partners, in their life time, 12.0% girls and 16.5% boys [7].

Contraception represents a modality to prevent pregnancy. Due to the prevalence of sexually transmitted diseases (YRBSS, 2005 – 9.1 millions cases of STD every year, half of these in population of 15 – 24 years of age; from the approximate 4800 cases of HIV – AIDS diagnosed annually, 13% have ages between 15 and 24 years), through contraception we try to reduce the emergence of sexually transmitted diseases risk, including HIV/AIDS [7].

In reality, the only contraceptive offering a significant diminish of the risk for both STD and pregnancy, is the condom. Today there are a great variety of contraceptive methods and products: behavioral methods (the calendar method, coitus interruptus, oral sex, anal sex, and reciprocal masturbation), hormonal methods (oral contraception, depo-provera, norplant) and mechanical methods (spermicidal, diaphragm, contraceptive sponge, intrauterine devices, condoms; voluntary sterilization – vasectomy and tubes ligatures) [12,13].

The American YRBSS 2005 Study shows that 62.4% of the high school students have used condoms in their last intercourse, out of those sexually active, 55.9% girls and 70.0% boys; 17.6% used oral contraceptives in their last intercourse, out of those sexually active, 20.6% girls and 14.6% boys [7].

The sexuality has a massive influence on the identity development of adolescents. Sexual identity is not fully assumed and consequently followed in adolescence. Sexual identity and sexual behavior shows increase fluidity (repetitive change of the sexual identity), more present in girls, even if the feelings of sexual attraction may appear more constant. Near the end of adolescence, it is considered the sexual options are already clarified and permanent. But there is no general rule therein [14-17].

In multiple different studies, adolescents have reported an early debut of sexual activity, multiple sexual partners, the use of psychoactive substances, and sexual abuse in childhood. A relatively low percent declared the use of condom in their last intercourse. Unprotected sex was associated with a lack of intention concerning the use of condoms, pregnancy, occasional partner, persons who practiced anal sex [18,19].

The use of alcoholic beverages and unprotected sex are usual behavior and are responsible for a large proportion from the

total diseases. None the less it exists quite few literatures on their coapparition and interaction, even on their contribution to the HIV virus infection. There is a clear contrast with the specialty literature on the use of injected drugs and the infection with HIV. The use of alcohol is associated with sexual behavior in a large social and cultural variety. In the case of alcohol consumption before intercourse, risk behavior, as unprotected sex, are more likely to happen [20,21]. Young people are more likely not to practice safe procedures of sexual behavior when they are under the influence of alcohol. The perception that the alcohol has a desinhibiting effect propel certain persons to consume alcohol, for these people to engage in behaviors they usually would not take part to. The alcohol consumption should be recognized as a risk factor for the transmitting of HIV and other sexually transmitted diseases. The synergy between the sexual behavior and the alcohol consumption multiplies enormously the potential negative consequences of the two behaviors taken separately [22,23].

In a study conducted on a randomized group of 3000 adolescents, ages between 17 and 19, from Norway, in the case of recent sexual relations, one in every 5 adolescents did not used contraceptive methods; one in every 3 adolescents used condom, and approximately 40% used contraceptive pills. The multilogistic analysis showed, in both girls and boys, the unprotected sex increase parallel to the use of alcohol before intercourse. The use of condoms was more frequent in the case of stable sexual relations [24].

Sexual orientation plays an important role in creating an identity during adolescence. For realistically understanding the sexual orientation in adolescents, a differential regard on the dimension of sexual orientations is indispensable. Thus, it is possible to describe sexual orientation patterns, including sexual attractions, fantasies, affiliations and behaviors [25].

The sexual violence manifests all around the world. Sexual abuse during childhood may diminish the self-esteem, the self-consciousness, the interpersonal relations and the trust. The impact of sexual abuse on the cognitive and emotional development of the child is very important, because the child feels betrayed, powerless, stigmatized. The commune emotional response includes anxiety, fear, depression, fury, self-reprehend, low self-esteem, deficiency in realizing intimate reports.

The fear from retaliation, the hostile attitude against homosexuality and the loss of self-esteem make boys to feel less like taking about the abuse than the girls. Studies on adolescent boys reported an association between the sexual abuse and the drugs abuse, violent behavior, the theft and the school absenteeism. Girls also find themselves in the role of sexual aggressors: sexual violence includes black-mail, intimidation, the menacing as a form of persuasion to sexual relations. There can also be considered the fact that sexual violence may be inflicted on an individual who is not capable to consent, for example, if being in a state of intoxication or under the influence of drugs [26-28].

Considering the sensitive nature of the subject, the sexual constraint or the sexual activity nonconsensual is difficult to research. The subject is the most sensitive among young people, the age group where constraint is more likely to take place. The studies evince different ways of evaluating the constraint. In some of these, the enforcement was defined for any sexual activity that was not consensual; in other cases, a considerable age difference between partners was considered as an indirect indicator of constraint, but in other cases was difficultly to defined as rape sex with much older men then their partner, who exchanges money and/or gifts for sex [29-32].

There is information on sexual abuse during childhood performed not only by adults, but also by children. Many adults and adolescents offenders begin committing abuse and show the first sexual behavior problems at young ages [33]. Data from Child Protection Agencies indicated that 40% of the total number of sexual abuses in childhood is perpetrated by young people under the age of 20 years, and up to 18% are perpetrated by children under the age of 13 years [34]. The incidence of sexual abuse carried on by children is high [35]. Only few children disclose the sexual misbehaviors, even when they are interviewed [36]. The recognition of sexual behavior problems in children, also to those at risk to develop this kind of problems, is of vital importance for facilitating the treatment and early prevention.

The most important elements for developing problems of sexual behavior were identified, as being those connected to the experience of the sexual abused child. These included sexual arouse of the child during the abuse, sadistic abuse, the active implication of the child in the abuse, the role of offender in child – child acts, blaming the child for the abuse [37]. Some indicators of severe abuse, with high psychological impact, include penetration or sexual contact, great duration and frequency of abuse, abuse in very young ages, multiple offenders, and sexual contact with physical force [38].

A substantial proportion of adolescents expose themselves to practices with risk for the sexual behavior, especially unwanted pregnancies and sexually transmitted diseases. In spite the priority granted to the problems regarding sexuality in schools and health centers during the last decades, the percent of those who do not use contraception is high. The developing of health promoting activities, able to address those groups of adolescents who do not use contraception remains important [39,40].

Monitoring sexual behavior in general population, centered on risk behavior, more than on risk groups, is fundamental for

promoting healthy sexual behavior as a concept along life [41].

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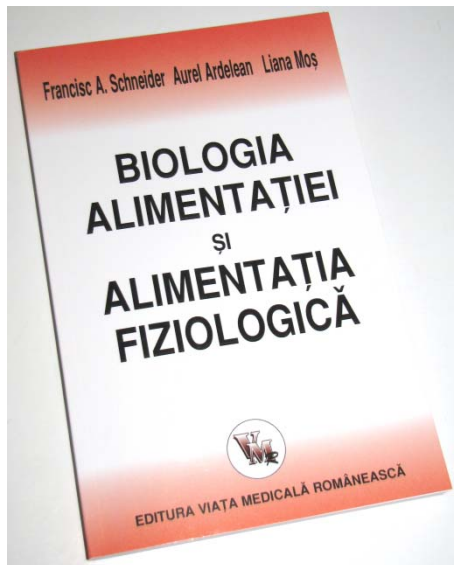
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## BOOK REVIEW

### **The Biology of Nutrition and Physiological Nutrition** **Francisc A. Schneider, Aurel Ardelean, Liana Moș**



The interesting monograph entitled *The Biology of Nutrition and Physiological Nutrition*, skillfully written by the teachers of the Western University "Vasile Goldiș" of Arad, constitutes an important work of high prestige and exceptionally scientific knowledge, extremely useful to a large number of doctors, students, dietiticians, constituting a reference point and landmark in the literature dedicated to these topics.

The authors address, at an elevated level and with an extensive, almost exhaustive bibliographical information, the whole scope of topics in this monograph, with a special competence given by the prolonged scientific preoccupations in both teaching and research, devoted to the issues regarding nutrition at different age groups and different lifestyles.

**Ordering:**  
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The title page must include the following informations:

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**The abstract** including maximum 150 words will be **written in both Romanian and English**, at the beginning of the article (British or American English, not a combination of the two). The abstract will describe the context and purpose of the study, the material and method of study, main results and conclusions. New and important aspects of the study will be emphasized.

**A number of 3-5 key-words will be given.**

#### INTRODUCTION

Show the importance of the approached theme. Clearly state the aim, objective or research hypothesis. Only make strictly pertinent statements and do not include data or conclusions of the presented paper.

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*Technical information.* Identify the methods, equipments and procedures offering sufficient details to allow other researchers to reproduce the results. Cite reference sources for the used methods by arabic figures between square brackets. Describe new or substantially changed methods, indicating the reasons for using them and assessing their limitations.

*Statistics.* Describe statistical methods using sufficient details for an informed reader who has access to original data to be able to verify the presented results. Whenever possible, quantify the results and present them accompanied by appropriated indicators for the error or uncertainty of measurement. Specify the used programme for statistical analysis.

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