

Clinical and epidemiological aspects in standardization of forensic psychiatric services

Silvia Gherasim, Valentin Oprea, Larisa Spinei, Mihail Hotineanu

Silvia Gherasim: M.D., MPH., Forensic psychiatrist, Chief of the Forensic psychiatry department, Clinical Psychiatric Hospital, Chisinau, the Republic of Moldova.

Valentin Oprea: M.D., Ph.D., Associate Professor chair of Psychiatry, Narcology and Medical Psychology, State University of Medicine and Pharmacy „Nicolae Testemitanu”, Medical Director, Clinical Psychiatric Hospital, Chisinau, the Republic of Moldova.

Larisa Spinei: Professor, Ph.D., State University of Medicine and Pharmacy „Nicolae Testemitanu”, School of Public Health.

Mihail Hotineanu: M.D., Ph.D., Associate Professor chair of Psychiatry, Narcology and Medical Psychology, State University of Medicine and Pharmacy „Nicolae Testemitanu”, General Director, Clinical Psychiatric Hospital, Chisinau, the Republic of Moldova

ABSTRACT

This article focuses on the clinical and epidemiological aspects in standards of practice and standards of care in the elaboration of forensic psychiatry services. The authors present their study of 586 patients, which were evaluated during 2012 at the Forensic Psychiatry Department (FPD) of Clinical Psychiatry Hospital (CPH), Chişinău. In the article, there are offered demographic, clinical and epidemiological information regarding this study.

KEYWORDS

FMHA, standard of care, standard of practice

INTRODUCTION

The forensic psychiatric field of mental health has experienced important conceptual and empirical advances in the last two decades around the world. However, despite these advances, there is still considerable inconsistency in the quality of the practice of forensic psychiatric examination. The approach criteria of forensic psychiatric expertise (FPE) are associated both with legal requirements and psychiatric theory. The comparative study of these criteria leads to the conceptual harmonization and the risk management [4].

Standardization of medical services is dictated not only by the current health care needs, but also for developing a basic algorithm used in assessing the results of the provided services, which confirms documental the correctness of the doctor's actions [1].

The basis for planning scientific researches and management actions are the epidemiological investigations, the results of which are going to optimize the organization and the functioning of the FPE service. To maintain a decent level of the FPD, and to ensure its future development, an acute necessity appeared for new medico-economic models in the work for this service. These models will be based on the particularities of clinical manifestations of surveyed people, but also on the socio-demographic characteristics of the served quota, that will make the clinical diagnosis volume of expert examination, the service structure, the assessment of the quality of the examinations and of the expressed findings, in relation to financial expenses involved in their implementation. The standardization of expert forensic psychiatry activity consists in the development of the common requirements versus the technology or the modality way of performing the expert examination, the

conditions, the means and the resources involved in this activity. The standardization process is systematic and involves the clinical and epidemiological study of the quota of the expertise people in order to find out the requirements of FPE; the formation of "patterns of expertise patients", that require identical type and volume FPE; the development of unified criteria in the process of carrying out the expert examination and expressing the final expert conclusions; the appreciation of licensed requirements and conditions of FPE.

The clinical protocol assures us that the process of diagnosis, treatment, or rehabilitation, etc., will be applied to the same extent as the preset model in various institutions throughout the country [3].

THE OBJECTIVES OF THE STUDY

Consist in the examination of the clinical and social peculiarities of people directed at FPE in different branches of the service and the quota analysis of the expertise in accordance with all FPE types depending on the nosologic structure, the complexity of the examination and the formation of "patterns of expertise patients".

MATERIAL AND METHODS

The authors performed a descriptive study. In order to achieve the objectives it was set up a representative sample of $n = 586$ people expertise on the forensic psychiatric service Public Medical-Sanitary Institution (PMSI) Clinical Psychiatric Hospital (CPH), Chisinau. The data of the descriptive study have been accumulated and analyzed in three directions: time – year 2012; place – ambulatory and stationary subdivisions FPD PMSI CPH; person – children, adults, women and men.

The inclusion criteria in this study are:

1. age (child < 17 years 11 months 28 days, adult);
2. women/men;
3. persons deprived or not of their liberty at the time of the examination;
4. examined patients in ambulatory/stationary conditions;
5. the presence of the ordinance (conclusion) of the investigation/enforcement court to perform the following types of expertise:
 - simple forensic psychiatric;
 - psychiatric and psychological in the complex;
 - psychiatric and narcological in the complex;
 - psychiatric and sexological in the complex.

The questionnaire according to the FPE's type and the patients' pattern was elaborated by the authors. This information was collected from the official medical documentation: the medical records of the stationary patient (medical documentation form F003/e), forensic psychiatric expert reports (medical documentation form 101/e and 100/e), records of ambulatory and stationary forensic psychiatric expertise (medical documentation form 105/e), and the branch statistical report on the activity of the Forensic Psychiatric Commission (form 41).

Using the descriptive method of epidemiology – the research is based on a descriptive epidemiological study, which sets up the differential structure of the quota of people straightened in the FPE, through the following main parameters: gender, age, clinical diagnosis, procedural status (in police custody or not), the FPE's type depending on the conditions and complexity of its performance. The comparison method allowed the analysis of the primary data of the FPE in stationary and ambulatory conditions, depending on the socio-demographic characteristics of expertise people.

RESULTS

The studied sample was divided according to the conditions of the examination principle – the examined people in ambulatory conditions and those examined in stationary conditions, depending on age and gender. Thus, the most numerous group is the adults group with an impressive rate in the whole service – 481 patients (79.2 % of all research group), as in subdivisions – 195 people in stationary conditions or 87 % of the total number of patients admitted to the FPE, and 286 people or 74.4 % of the number of people examined in ambulatory conditions. The total amount of examined people in all age groups was 439 (75 %) men and 147, respectively (25 %) women; in the hospital of forensic psychiatric expertise, there were 175 (83.3 %) men and 35 (16.7 %) women and, from the number of people examined in ambulatory conditions, 264 (70,2 %) were men and 112 (29.8 %), women.

Within the framework of the study, there were compared relative indicators in each age group, depending on the gender. In order to study the feature according to age and sex, all the expertise people were divided into four age groups (≤ 14 years, 14 – 18 years, 18 – 65 years and ≥ 65 years).

In the first group, there were included children up to 14 years, as the number of girls in this subgroup is bigger (in FPE fully stationary and ambulatory with the ratio 2:1 girls/boys). Children of this age can't be held liable for their criminal acts and are directed in the FPE having a procedural status of injured parties in offences concerning the sexual life (in most cases), in this case, that is, the sexual abuse of a minor, who has not attained the age of 14 years, most often affects the girls.

Table 1 The characteristics of the research group according to age and gender (abs, %)

The examining conditions	Stationary FPE, n=210						Ambulatory FPE, n=376					
Gender	Men		Women		Total amount		Men		Women		Total amount	
	abs	%	abs	%	abs	P±ES (%)	abs	%	abs	%	abs	P ± ES (%)
Age												
≤ 14 years	0		5	2.4	5	2,4 ± 1.06	14	3.7	27	7.2	41	**** 10,9 ± 1.61
14 – 18 years	8	3.8	2	1.0	10	4,8 ± 1.48	16	4.3	22	5.8	38	** 10,1 ± 1.56
18 – 65 years	156	74.3	27	12.9	183	87,1 ± 2.31	225	60.0	56	14.9	282	**** 74,9 ± 2.24
≥ 65 years	11	5.2	1	0.5	12	5,7 ± 1.59	9	2.4	6	1.6	15	* 4.0 ± 1.01

* $p > 0.05$ ** $p < 0.05$ **** $p < 0.001$

That is also confirmed by the data from studies conducted by other authors, highlighting that the prevalence rates of children sexual abuse in European countries varies from 7 % (in Ireland) to 36 % (in Austria) for girls and between 3 % (Sweden and Switzerland) and 27 % (United Kingdom) for boys [7]. From other sources, about 20 % of women and between 5 – 10 % of men have been subjected to sexual abuse during their childhood [5].

In the subgroup of adolescents of 14 – 18 years – as shown in this group – the boys prevail in stationary FPE, given the fact that from the number of teenagers straighten at the examination, unlike the previous group, there are also criminal teenagers, of which the majority are male, which requires a more thorough examination, in order to respond to the objectives set before the experts. The data obtained in this study are consistent with the statistical data on juvenile delinquency in the country – 14.1 % of those convicted are minors [8]. The number of girls in this subgroup is insignificantly higher in ambulatory FPE, exemplifying the similar cause of the previous sub-group – sexual victimology in adolescents.

Adults between 18 and 65 years accounted for the largest share of all research groups (74.9

%). The elderly population, over 65 years, has the lowest share in the FPD (4 %). The characteristic of the research group according to age and gender is given in table 1.

In order to point out the nosologic structure of the quota, those expertise were divided according to the requirements of statistical documentation (statistical report No. 38) in 7 nosologic groups, respecting the requirements of the Classification of Mental and Behavioral Disorders ICD-10 (table 2). The obtained data can be correlated with the data from other studies that reveal that 5 – 7 % of the population over 65 years is affected by various forms of dementia, and up to 10 % of the population presents early signs of dementia [6]. Schizophrenia, delusional and schizotypal disorders occupy the third place in diagnosed mental disorders and represent – 13.5 % (13.118 people) in 2011 [2]. The nosologic group *Other Mental Disorders* represents a summary of the pathologies found in a very small number and without any forensic psychiatric importance, thus 8.5 % of all diagnosed pathologies in ambulatory FPE. In this nosologic group, were included, for example, the mental and behaviour disorders caused by the use of narcotic substances and alcohol (F10-19) in only 13 people or 2.2 % of all research groups. This is due to the situation

in which Alcoholism or Drug Addiction is often the “secondary” diagnosis in practice; or rather comorbidity to mental disorders, the actual current study has taken into account the basic nosologies.

Table 2 The nosologic structure of the research group according to the requirements of the examination (abs, %)

Nosologic groups	FPE of examined people in stationary conditions (abs., %)	FPE of examined people in ambulatory conditions (abs., %)	TOTAL AMOUNT (abs., %)
Mental retardation (F70 – F74)	55 (26,1 ± 3.03 %)	91 (24,1 ± 2.18 %)*	146 (24,9 ± 1.79 %)
Personality disorder and organic behaviour (F07 + G40)	56 (26,6 ± 3.05 %)	59 (15,6 ± 1.87 %)**	115 (19,6 ± 1.64 %)
Schizophrenia, delusional and schizotypal disorders (F20 – 29)	43 (20,5 ± 2.79 %)	41 (10,9 ± 1.61 %)***	84 (14,3 ± 1.45 %)
Personality and behaviour disorders in adults (F60 – F69)	19 (9.0 ± 1.97 %)	24 (7.0 ± 1.45 %)*	43 (7,3 ± 1.07 %)
Without psychiatric disorders	31 (14,7 ± 2.44 %)	113 (30.0 ± 2.36 %)****	144 (24,6 ± 1.78 %)
Dementia (F00 – F03)	6 (2,9 ± 1.16 %)	16 (4,2 ± 1.03 %)*	22 (3,8 ± 0.79 %)
Other mental disorders	0	32 (8,5 %)	32 (5,4 %)

* $p > 0.05$ ** $p < 0.05$ *** $p < 0.001$

The small number of people without any mental disorders examined in stationary conditions is due to the fact that the majority of examined patients that are not in psychiatric supervision and do not have obvious signs of mental disorders initially improve when they are examined in ambulatory conditions.

In order to achieve the objectives set in this study, the authors have also studied the characteristics of the examined contingent according to gender, the FPE type (ambulatory and stationary expertise) and the conditions under which the expert actions were carried out (for people in police custody or that aren't in police custody) (table 3).

Table 3 The quota's characteristics according to the FPE type, the examination conditions and gender (abs, %)

The FPE conditions and type	Men		Women		Total amount, n=586	
	abs	P ± ES (%)	abs	P ± ES (%)	abs	P ± ES (%)
FPE for people that are in police custody in stationary conditions	100	17,1 ± 1,56	12	**** 2,1 ± 0,59	112	19,1 ± 1,63
FPE for people that are not in police custody in stationary conditions	75	12,8 ± 1,38	23	**** 3,9 ± 0,80	98	16,8 ± 1,55
FPE for people are in police custody in ambulatory conditions	93	15,9 ± 1,51	5	**** 0,9 ± 0,39	98	16,8 ± 1,55
FPE for persons that are not in the police custody in ambulatory conditions	171	29,2 ± 1,88	106	***** 18,1 ± 1,59	278	47,3 ± 2,06

***** $p < 0.001$

Depending on the complexity of the conducted forensic psychiatric expertise the studied quota was divided into two subgroups:

- 1. People examined in simple FPE, involving only the judicial psychiatric experts.
- 2. People examined in complex FPE that need the involvement of experts of other specialties.

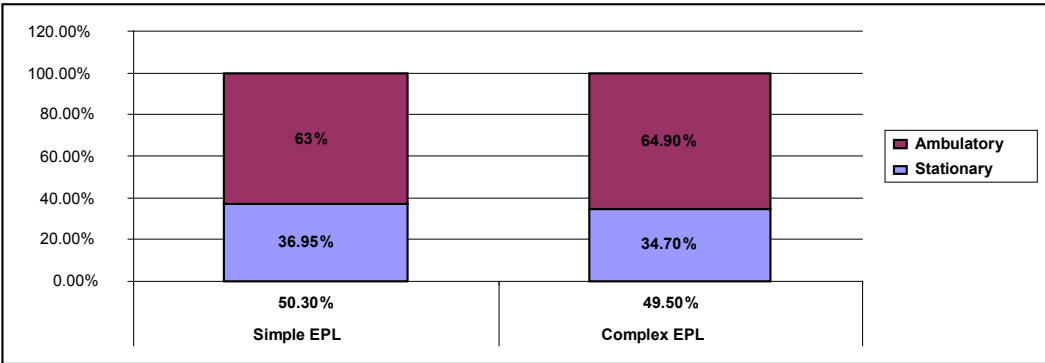


Figure 1. The EPL structure depending on complexity (%)

As you can see, the most complex expertise is performed in ambulatory conditions, due to the fact that minors, the injured parties of sexual abuse, the victims of torture and inhuman and degrading treatments, on which complex FPE are most often performed, in the majority of cases, they pass the examination in ambulatory conditions (Figure 1).

The patients, which were examined in complex FPE, were further divided into three subgroups depending on the FPE’s complex character – psychiatric and psychological expertise (complex FPPE), psychiatric and narcological (complex FPNE) and, psychiatric and sexological (complex FPSE). The research group of this topic was also studied depending

on the conditions of the examination (ambulatory or stationary) and the age groups (adult/minors) (Figure 2).

In this context, it should be noted that mandatory FPPE are made by authorized officers, in minors’ cases, regardless of their status in the criminal or civil process (accused/suspect, witness or injured party in the civil trials).

When the expertise person is accused of trafficking drugs and other psychoactive substances, psychiatric and narcological expertise are carried out.

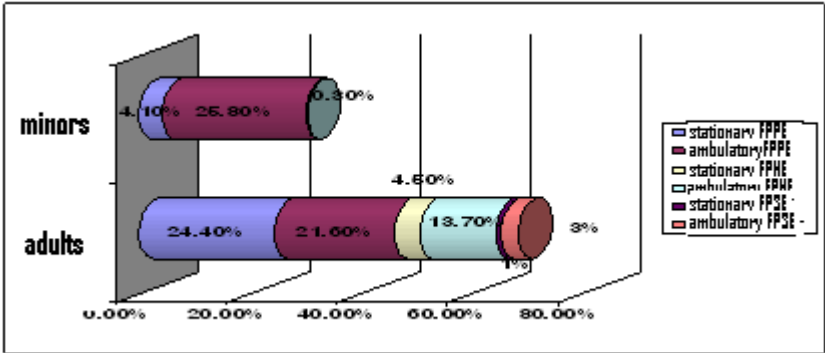


Figure 2. The structure of complex FPE, in the research lot, according to age category (%)

Due to recent changes in the criminal law, in particular concerning the chemical castration of pedophiles, in 2012 it appeared the requirement for carrying out compulsory psychiatric and sexological expertise in the complex. This type of expertise is not carried out within the framework of the forensic psychiatric expertise service in the country, due to the lack of legal experts in the field. This is the reason why there were included in the study cases, that have questions from sexopatology in their disposing ordinance of the FPE.

In order to differentiate the quota studied in “patterns of expertise patients” by the authors, the division principle depending on the clinical situation was chosen, meaning the FPE types (stationary and ambulatory), opposed to the practice used in medicine and in General Psychiatry, in particular. This is conditioned by the necessity of some experts-specialists; diagnose procedures needed in the expert examination process; examination conditions; the FPE terms, which depend on the examination conditions stipulated in the disposing ordinance/decision of the FPE and expert objectives layout to experts. The FPE disposing and the initial stage of the examination, in most cases, is carried out in a situation of diagnose uncertainty (except when the files of the documents show that the expertise person is diagnosed with a mental disorder in terms of psychiatric hospitalization and is under hospital specialized supervision).

The diversity of situational “patterns of expertise patients” and the appropriate medical and economical standards correspond to the FPE classifications enforced:

1. the living people FPE, based on the presented material (including the *post mortem*);
2. depending on the specialty of the involved experts and the objectives submitted to the expert, there are divided into: simple and

complex, the latest in turn being divided depending on the specialty of the involved experts (psychiatric and psychological, psychiatric and narcological, psychiatric and sexological, forensic psychiatry, etc.);

3. the FPE inside or outside the expertise institution (in the court, the investigator’s office, the prosecutor’s office, etc.);
4. depending on the examining conditions: ambulatory and stationary FPE;
5. depending on the legal status: the FPE for people that are in police custody and or not;
6. depending on age and sex: the FPE of minors and adult, males and females;
7. depending on the procedural legal status: the FPE in civil, legal, administrative trials.

On the basis of the above, we can determine the following “patterns of expertise patients”: I group – people examined in the simple FPE; II group – people examined in complex FPE. Inside each group we can distinguish various subgroups depending on the expert examining conditions: expertise people admitted to FPE in stationary conditions and people examined in ambulatory conditions. In each subgroup, we can distinguish the patterns of the patients according to the following main parameters: the people that are/are not in police custody; adults and minors; male and female. In addition, the patterns of the patients can be diversified depending on the FPE’s way – primary, additional or repeated, performed in civil or criminal proceedings, etc.

DISCUSSIONS

Based on the obtained data and on the defined criteria, we can outline the following medical and economic standards: MES-1 simple FPE in stationary conditions. The expert MES-1 includes: diagnosis activities carried out directly by the legal expert psychiatrist (the study and the analysis of the dossier and of the medical documents, the collection of complaints and

anamnesis data, physical examination, clinical supervision, additional investigations and analysis of results, prescription of treatment; preparing the report for the committee of experts, writing the forensic psychiatric expertise report); additionally: the pathopsychologic examination by the clinical psychologist; consulting the neurologist, therapist, ophthalmologist, gynecological examination – women, functional and laboratory investigations carried out in accordance with the requirements of the sanitary-epidemiological system, the minimum guaranteed by the State, etc.; The expert examination MES-2 simple FPE in ambulatory conditions includes: diagnosis activities carried out directly by the legal expert psychiatrist (the study and the analysis of the file and of the medical documents, the collection of anamnesis data and of complaint, the exploring of the patients; preparing the report for the committee of experts, writing the forensic psychiatric expertise report); additionally: the pathopsychologic examination by the clinical psychologist. The expert examination MES-3 complex FPE in stationary conditions differs from the first two through the large number of patterns of expertise patients, which differ depending on the specific objectives outlined in the ordinance/decision and on the experts' specialty included in the FPE committee. Therefore, it includes: diagnosis activities carried out directly by the legal expert psychiatrist or, where appropriate, by the psychiatrist-narcologist legal expert, by the psychiatrist-sexologist legal expert, by the legal

psychologist (the study and the analysis of the file and of the medical documents, the collection of complaints and anamnesis data, physical examination, clinical supervision, additional investigations and analysis of results, prescription of treatment; preparing the report for the committee of experts, writing the forensic psychiatric expertise report); additionally: the pathopsychologic examination by the clinical psychologist; consulting the neurologist, therapist, ophthalmologist, gynecological examination – women, functional and laboratory investigations carried out in accordance with the requirements of the sanitary-epidemiological system, the minimum guaranteed by the State, etc. The expert examination MES-4 complex FPE in ambulatory conditions differs from MES-2 through the large number of patterns of expertise patients depending on the specific objectives outlined in the ordinance/decision and the experts' specialty included in the FPE. Therefore, it includes: diagnosis activities carried out directly by the legal expert psychiatrist or, where appropriate, by the psychiatrist-narcologist legal expert, by the psychiatrist-sexologist legal expert, by the legal psychologist (the study and the analysis of the dossier and of the medical documents, the collection of complaints and anamnesis data, physical examination, clinical supervision, additional investigations and analysis of results, prescription of treatment; preparing the report for the committee of experts, writing the forensic psychiatric expertise report).

CONCLUSIONS

1. The most numerous group is the adults group with an impressive rate in the whole service – 481 patients (79.2 % of all research group), as in subdivisions – 195 people in stationary conditions or 87,1 % (74,3 % men and 12,9 % women) and 286 people or 74.9 % (60 % men and 14,9 % women) of the number of people examined in ambulatory conditions; a smaller but representative enough number of children ≤ 14 years, 7.8 % the total amount on the service in stationary conditions, representing 2,4 % (all female gender) of expertise people and respectively,

10.9 % (3.7 % boys and 7.2 % girls) in ambulatory conditions and it highlighted the significant difference between the subgroups ($p < 0.001$); in ambulatory FPE people between 14 – 18 years accounted for 8.1% of all research group, distributed as following – 4,8 % (3.8 % boys and 1.0 % girls) in stationary conditions and 10,1 % (4.3 % boys and 5.8 % girls) in ambulatory conditions, in this group it was detected a insignificant difference ($p < 0.05$); the elders (age $65 \leq$ years) had the smallest share in the FPD of 5.0 %, which insignificantly differs from both groups of FPE – 5.7 % (5.2 % men and 0.5 % women) in stationary conditions and 4,0 % (2.4 % men and 1.6 % women) of all the research groups in ambulatory conditions, in this group it was not detected any statistical difference ($p > 0.05$).

2. From a nosologic point of view, the most representative group, with 24,9 %, is the nosological group of mental retardation of different degrees (26.1 % in stationary FPE and 24.1 % in ambulatory FPE, the statistical difference between the two groups was not detected $p > 0.05$), followed, at a slight difference, by the mental and behaviour disorders of organic origin with 19,6 % (26,6 % in stationary FPE and 15.6 % in ambulatory FPE, the statistical difference between the two groups it's insignificant ($p < 0.05$). In addition, the biggest nosological groups proved to be the expert group diagnosed with schizophrenia and other delusional schizotypal disorders (14,3 %), and the adults personality and behaviour disorders (7.3 %).

3. In stationary conditions, 112 arrested people were examined, meaning 19,1 % of all research groups, of whom 100 (17.1 %) men and 12 (2.1 %) women, according to age – 96,4 % adults and 3.6 % children. There were fewer people that were not arrested and they amounted to 98 expertise people or 16.8 % of all research groups, of whom 75 (12.8 %) men and 23 (3.9 %) women, the number of children from this subgroup is bigger, 11,2 % *versus* 88.8 % adults.

4. In ambulatory conditions, 98 arrested people were examined, meaning 16.8 % of all research groups, of whom 93 (15.9 %) were men and 5 (0.9 %) women, according to their age there were – 94,8 % adults and 5.2 % children. There were more people that were not arrested and they accounted for 277 expertise people or 47.3 % of all research groups, of whom 171 (63,3 %) men and 106 (36,2 %) women, the number of children from this subgroup was bigger than in any subgroup and accounted for 27.6 % *versus* 72.4 % adults

5. The structure of the complex FPE in stationary conditions accounted for 34.7 % or 291 people. Complex FPPE in stationary conditions has been carried out in 82 cases (28,3 % of the all research groups) of which 72 patients or 86.5 % were adults and 12 children, 13.5 %; complex FPNE in stationary conditions were carried out in 13 cases (4.5 % of all research groups) all being mature individuals and complex FPSE in stationary conditions amounted 1 % of all research groups with three cases, all adults.

6. The total number of persons who have been subjected to complex FPE in ambulatory conditions was 189 expertise people, meaning 32.3 % of the research groups, from this subgroup 70,2 % were men and 29.8 % women. The minors in this subgroup constituted 1.1 % of whom children under 14 years weren't present, and teenagers 14 – 18 – 2 children (50 % boys and 50 % girls). The number of adults was the most representative one, 18 – 65 years representing 184 98,9 % (73,3 % men and 26.3 % women).

7. In order to differentiate the studied quota on “patterns of expertise people” by authors, the principle of division depending on the clinical situation was chosen, meaning the FPE's types (ambulatory and stationary), opposed to the practice used in medicine and in General Psychiatry in particular.

8. The medical and economic standards in the FPE can be used in the organization of forensic psychiatric expertise services as a management tool, planning and funding. The proposed variant can serve to assure the quality and the economic efficiency of FPE services. The proposed MES FPE structure can be used as an appropriate mechanism of utilizing existing psychiatric resources and allows their distribution according to the present needs. In general, the study enables the reorganization of the forensic psychiatric expertise service in the country, by bringing the expert volume, guaranteed by the State, according to the available financial resources.

ACKNOWLEDGMENTS AND DISCLOSURE

The authors declare that they have no potential conflicts of interest to disclose.

REFERENCES

1. Baciú Gh. Particularități ale standardizării și valorificării activității medicale, Sănătate Publică, economie și management în sănătate 1(23)/2008, pp. 11-14
2. Chihai Jana, Analiza morbidității prin tulburări mintale și de comportament în Republica Moldova pentru anii 2007-2011.
3. Ciocanu Mihai, Inga Păscenic Elaborarea și implementarea protocoalelor clinice standardizate ale locului de lucru pentru medicii de familie.
4. Freckelton I. "Current legal issues in forensic psychiatry", Homicide: Patterns, Prevention and Control p.p.187-192
5. UNICEF Raportul 2006 Copii la limita speranței. - București: Vanemond, 2006 ISBN 978-973-1733-01-9
6. Popescu Cristian D. Demența – cauze și diagnostic, www.umfiasi.ro/
7. Rădulescu, S., M., Inocența și violența erotică. Abuzul sexual exercitat în familie asupra minorilor, Editura Lumina Lex, București, 2010
8. Rotari Oxana, Delincvența Juvenilă: probleme actuale și căi de soluționare, Universitatea Liberă Internațională din Moldova, Chișinău 2010

Correspondence:

Silvia Gherasim

PMSI Clinical Psychiatric Hospital, Costiujeni Street No. 3, MD-2011,
Chisinau, the Republic of Moldova,
Phone: + 373 22 85-72-41
Fax: + 373 2276-15-69

E-mail: imsp_scp@mail.ru
silgera@yahoo.com

*Date of Submission: September, 12, 2013 /
Acceptance: November, 07, 2013*