

RESEARCH

Cognitive status of persons under guardianship living in a social welfare institution

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Abstract

Background: The need for institutionalisation of elderly people derives from high rate of comorbidity and ageing, which result in the decrease of cognitive and functional capacities of future residents. Critical point in the procedure of accommodation of the people with dementia and other chronic illnesses is statement of willingness to be accommodated. Results of numerous studies point out that the Mini Mental State Examination (MMSE) can be used as a screening test for rapid clinical assessment of legal capacities.

Method: The group of 91 examinees under legal guardianship protection has been compared with the group of 57 users not being under legal guardianship, on the bases of their cognitive status. The MMSE was used for evaluation of cognitive status.

Results: Between the examined groups, a significant statistical difference in total MMSE score was found ($F=19, 847$; $DF=2, 145$; $p<0.001$). Subjects with no legal guardian had much higher values of total MMSE score compared to the subjects under legal guardianship. There was a statistically significant difference in the recurrence rate of cognitive status categories between the examined groups ($\chi^2=29, 822$; $p<0.001$).

Conclusion: The total MMSE score significantly correlates with decision making and proper interest supporting capacities, i.e. with placing subjects under any type of guardianship, which makes plausible to consider applying this instrument in order to make a more exact assessment of decision making capacity.

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Modern times and life rhythm of today's man impose many challenges and change traditional social roles. Family compactness weakens, as well as the care of its elderly members. Considering constant increase of elderly population, social mechanisms for care of the elderly gradually become less and less efficacious. There is growing necessity to find new solutions and make serious reform of social welfare and healthcare systems.

The growing needs of one of the most vulnerable social groups put significant pressure on social and health insurance funds, and generate problems even in the most developed economies of the world. This problem came in the forefront at the end of the last and at the beginning of this century. The bell started ringing after astonishing data about rapid and progressive ageing of the world's population came to the public. During year 2012, persons older than 60 years consisted 11.5% of the whole seven billions population. The fact that makes the greatest concern is that the older population is growing old as well,

i.e. the number of people older than 80 is growing the fastest of all in the whole population of old people. Worldwide, 1.6% of population is over 80 years of age, and there are some estimates that this percentage will reach 4.3% until year 2050, or about 402,000,000 in absolute numbers.[1]

The data from the last census in Serbia in 2011 show even grimmer picture than is the global one. Serbia is a country with the highest ageing index in Europe, and Serbs are one of the three oldest nations in the world. Out of the 7.2 million inhabitants, even 2.8 millions are between 50 and 59 years of age, which makes them the most numerous subpopulations within the country. Average age of the population in Serbia today is 41.2 years, and it will rise to 41.7 in 2015, without signs of slowing this horrific trend.[2] Even now financing of the pensions is becoming a problem (number of retired persons is slowly but steadily overcoming number of employed persons), as well as financing of healthcare

system which is becoming increasingly incapable of responding to increased demands of the ageing population. Considering necessity of decreasing funds paid by the state for social welfare and healthcare in the future, there is increasing awareness that new institutions should be founded with purpose of long-term care of elderly.

Many published studies from the area of gerontology suggest that reasons for institutional care of elderly are their frequent comorbidities and loss of cognitive and functional capacities.[3-7] Critical point during the process of institutionalisation of persons suffering from dementia or other chronic diseases is expression of their consent for stay in an institution. Apart from the attitude, there is always a controversy in regard to their capability of making appropriate decisions about institutionalisation, governing financial matters, signing a contract, etc.

A number of published studies confirmed high sensitivity, specificity, positive and negative predictive value of the Mini Mental State Examination (MMSE),[8] which could be used as a screening test for rapid estimate of the business acumen.[3,9,10]. The aim of this study was to estimate cognitive status of persons under guardianship living in a social welfare institution, as well as to correlate their cognitive status with the acumen.

Methods

The study design

This research was designed as a quantitative cross-sectional study.

The population

The study enrolled 148 participants from the welfare institution for elderly inmates, “Dolce Vita Kej” in Belgrade. Ninety one participants were persons under guardianship (with complete or partial loss of business acumen, and persons under temporary guardianship for lodging and disposal of assets issues). The basis for appointment of permanent or temporary guardian was existence of dementia (vascular, Alzheimer’s, alcoholic or unspecified) diagnosed by an expert psychiatrist according to criteria of current International Classification of Diseases and Related Health Problems, tenth revision (ICD-10).[11] The following inmates were excluded from the study: patients suffering from cancer, those with primary cognitive insufficiency, previously treated for other psychiatric diseases, and the inmates within the course of postoperative recovery. The group of inmates under guardianship was compared with the group of 57 inmates without guardianship.

The instruments

Cognitive status was estimated by the MMSE. It is a composite test with several simple tasks and maximal score of 30. The test estimates temporal orientation (range from zero to five), spatial orientation (range from zero to

five), short memory (range from zero to three), attention and calculation (range from zero to five), reproduction of memorised facts (range from zero to three), designation (range from zero to two), repeating (range from zero to one), listening comprehension (range from zero to three), reading (range from zero to one), writing (range from zero to one), constructional praxia (range from zero to one). Summing up the individual scores gives total score of the test. The cutoff value of the total score for dementia is 24. Usual grading of dementia is as follows: mild (20-24), moderate (11-19), and severe (zero to ten points). Total score is sensitive to cultural factors, education, and social milieu of the patient.[8] For basic screening and evaluation, MMSE is the most widely employed tool.[12]

The study procedure

In the beginning of the study, the inmates’ files were reviewed, containing documents typical for social welfare institutions according to the Social Welfare Law and Lodging Act issued by the Ministry of Labour and Social Politics. Besides, the data from personal documents (identity cards, birth certificate), from social history of the inmates, from the Legal Act about guardianship issued by Social Welfare Centre and from an inmate’s medical files (hospital discharge letters, certificate of health status issued prior to admission to the social welfare institution) were used in the study. All inmates were tested by the MMSE in the morning hours.

Ethical aspects

The study has been approved by the Ethical Board of the welfare institution for elderly inmates “Dolce Vita Kej”, number 623/13, of 15.01.2113.

Statistical analysis

Primary data were analysed by descriptive statistics and by hypothesis testing methods, using statistical software, Statistical Package for the Social Sciences (SPSS) version 20.0.

The following descriptive statistical methods were used: measures of central tendency (mean, median), variability measures (standard deviation), and relative numbers (structure indicators).

The following hypothesis testing methods were employed: one-way analysis of variance with Tukey posthoc test, Kruskal-Wallis test, Mann-Whitney test, and chi-square test. The probability threshold of null hypothesis was set at 0.05.

Results

The study enrolled 148 participants from the welfare institution for elderly inmates, “Dolce Vita Kej” in Belgrade. Ninety one participants were persons under guardianship. There were 37 (25.0%) male and 111 (75.0%) female participants (Table 1).

The male inmates were mostly under temporary guardianship (40.5%), and female inmates were mostly without guardianship (44.1%). There was significant difference in sex distribution among the study groups (chi-square=9.661; p=0.008).

Average age of the study participants was 81.8±8.7 years. There average age was significantly different among the study groups (F=6.723; DF=2.145; p=0.002). The inmates under complete guardianship were much younger than inmates without guardianship or under temporary guardianship.

Average value of total MMSE score for all participants in the study was 13.7±10.1. There was significant difference in total MMSE score among the study groups (F=19.847; DF=2.145; p<0.001). The inmates without guardianship had much higher MMSE score than inmates with temporary guardianship or those with permanent guardianship.

Among the study participants, severe cognitive impairment was noted in 55 (37.2%), moderate cognitive

Normal cognition was noted in 33.3% of inmates without guardianship; in 6.8% inmates, under temporary guardianship; and in 15.6% inmates, under permanent guardianship. There was significant difference in distribution of cognitive status categories among the study groups (chi-square=29.822; p<0.001) (Figure 1).

The study participants without guardianship, i.e. the persons with full business acumen, had significantly higher median scores than inmates under guardianship in each item of the MMSE test, except in constructional praxia (Table 2).

Out of the all study participants, 91 (61.5%) had score of zero at constructional praxia item of MMSE, and 57 (38.5%) of them had score of one. The constructional praxia was rated one in 57.9% of inmates without guardianship, in 15.3% of inmates with temporary guardianship, and in 46.9% of inmates with permanent guardianship. The differences between scores of constructional praxia among the study groups were not significant (chi-square=4, 755; p=0.093).

Table 1. Socio-demographic characteristics of the study participants, total MMSE score and categories of cognitive status (N=148)

Variable	Guardianship type			Statistics			
	Temporary (n=59)	Permanent (n=32)	Without (n=57)	χ ²	DF	F	p
Sex, female	44 (39.6%)	18 (16.2%)	49 (44.1%)	9.661			0.008
Age (X̄±SD)	82.5±7.5	77.1±9.8	83.8±8.4		2, 145	6.723	0.002
MMSE score	9.1±8.6	11.9±9.9	19.4±8.8		2, 145	19.847	<0.001
MMSE category of cognitive status							
Severe impairment	32 (54.2%)	15 (46.9%)	8 (14.0%)	29.822			<0.001
Moderate impairment	20 (33.9%)	10 (31.2%)	20 (35.3%)				
Mild impairment	3 (5.1%)	2 (6.2%)	10 (17.5%)				
Normal cognition	4 (6.8%)	5 (15.6%)	19 (33.3%)				

MMSE : Mini Mental State Examination

impairment in 50 (33.8%), mild impairment in 15 (10.1%), and normal cognition in 28 (18.9%) of them.

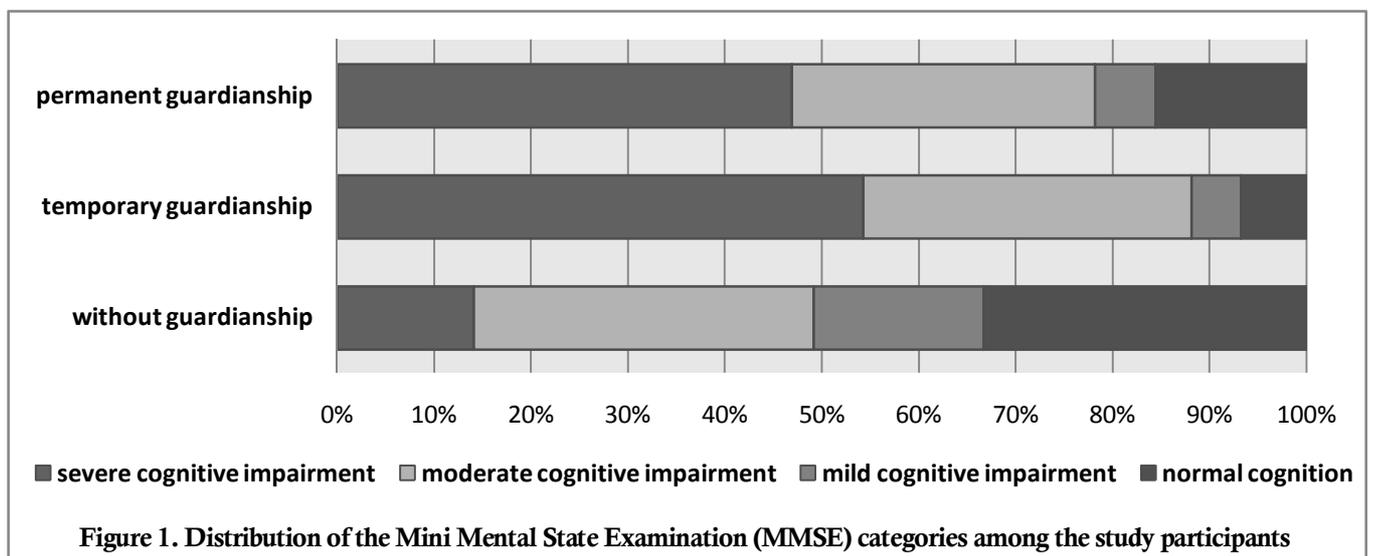


Figure 1. Distribution of the Mini Mental State Examination (MMSE) categories among the study participants

Table 2. Cognitive status of the study participants according to individual items of the MMSE test (N=148)

Variable	Guardianshp type			Statistics	
	Temporary (n=59)	Permananet (n=32)	Without (n=57)	χ^2	p
Orientation in time in med (min-max)	0 (0-5)	1 (0-5)	3 (0-5)	22.421	<0.001
Spatial orientation in med (min-max)	2 (0-5)	2 (0-5)	5 (0-5)	25.040	<0.001
Attention and calculation in med (min-max)	0 (0-5)	0.5 (0-5)	4 (0-5)	19.561	<0.001
Short memory				22.503	=0.001
Score 0	21 (35.6%)	11 (34.4%)	6 (10.5%)		
Score 1	10 (16.9%)	2 (6.2%)	2 (3.5%)		
Score 2	5 (8.5%)	5 (15.6%)	7 (12.3%)		
Score 3	23 (39.0%)	14 (43.8%)	42 (73.7%)		
Reproduction of memorised facts				26.608	<0.001
Score 0	48 (81.4%)	27 (84.4%)	25 (43.9%)		
Score 1	5 (8.5%)	2 (6.2%)	11 (19.3%)		
Score 2	2 (3.4%)	2 (6.2%)	4 (7.0%)		
Score 3	4 (6.8%)	1 (3.1%)	17 (29.8%)		
Designation				13.582	=0.001
Score 0	26 (44.1%)	12 (37.5%)	8 (14.0%)		
Score 1	5 (8.5%)	2 (6.2%)	4 (7.0%)		
Score 2	28 (47.5%)	18 (56.2%)	45 (78.9%)		
Repeating				11.243	=0.007
Score 0	42 (71.2%)	17 (53.1%)	23 (40.4%)		
Score 1	17 (28.8%)	15 (46.9%)	34 (59.6%)		
Listening comprehension				23.137	<0.001
Score 0	27 (45.8%)	11 (34.4%)	8 (14.0%)		
Score 1	6 (10.2%)	2 (6.2%)	2 (3.5%)		
Score 2	7 (11.9%)	1 (3.1%)	2 (3.5%)		
Score 3	19 (32.2%)	18 (56.2%)	45 (78.9%)		
Reading				14.076	=0.001
Score 0	45 (76.3%)	18 (56.2%)	24 (42.1%)		
Score 1	14 (23.7%)	14 (43.8%)	33 (57.9%)		
Writing				23.465	<0.001
Score 0	50 (84.7%)	17 (53.1%)	24 (42.1%)		
Score 1	9 (15.3%)	15 (46.9%)	33 (57.9%)		

MMSE=Mini Mental State Examination

Discussion

In the United States of America (USA) and Europe, between 1/2 and 2/3 of institutionalised elderly persons suffer from dementia.[13] It is estimated that four to five per cent of people older than 65 have dementia, with tendency of doubling after each five years of age after 65. During year 2000, there were about 18,000,000 persons with dementia all over the world, and it is predicted that there will be about 25,000,000 of them in the year 2040.[4] Therefore, dementia is a global problem. According to the estimates of "Association Alzheimer"

from Sremska Kamenica, there are more than 160,000 patients with dementia in Serbia, with an increasing trend. This estimate was based on data from the Republic Institute for Statistics, showing that in 2010 there was 1,233,412 inhabitants older than 65 in Serbia, and on prevalence of Alzheimer's dementia of 13% among older than 65, according to the World Association for Alzheimer's disease.[14]

Difficulties in reasoning and decision making lead to loss of business acumen. The health of the elderly is endangered by the suffering from financial hardship as

well as social isolation. In order to prevent them from the hardship of economic and social problems, measures need to be implemented. These should be adequate, timely, and dynamic, and implemented at international, national, and local levels.[15]

In a randomised study on 100 inmates from four nursing homes for elderly in Dublin, cognitive impairment was tested by the MMSE. There were 11% of inmates without cognitive impairment (MMSE score 27-30), 20% with mild cognitive impairment (MMSE score 21-26), 27% with moderate cognitive impairment (MMSE score 11-20), and 42% with severe cognitive impairment (MMSE score zero to ten).[3]

In the study of the welfare institution for elderly inmates in Belgrade, normal cognition was found in 28 out of 148 inmates (18.9%). Mild cognitive impairment was detected in 15 users, i.e. 10.1%. Moderate cognitive impairment was found in 50, i.e. 33.8% participants, while 55 participants or 37.2% of them had severe cognitive impairment.

The study carried out in six different welfare institutions for elderly inmates in the USA, where decision making capacity of 364 residents was estimated, showed that the average age of examinees was 86.1 years; 84% of participants were women, and the average MMSE score was 18.0. Cognitive status, estimated on the MMSE basis, was the only variable that was a significant predictor of decision making capacity, with 84% of positive predictive value, and 52% of negative predictive value (total degree of congruence was 65%). Age and gender were not significantly correlated with decision making capacity.[10]

The study that examined correlation between the cognitive impairment degree in patients with Alzheimer disease and their capacities for decision making as well as for supporting own interest included users of the consultation service for psycho-geriatrics at the Queen Elisabeth Psychiatric Hospital in Birmingham, Great Britain. Estimation of cognitive impairment was made using the MMSE. A statistically significant correlation between cognitive impairment level and capacity for decision making and supporting own interest was found ($p < 0.0001$). The MMSE score was a significant predictor of decision making capacity. Using the 18 MMSE score as a cutoff point, the optimal sensitivity (86.6%) and specificity (82.2%) of the test have been obtained. Positive predictive value was 75.8%, and negative predictive value was 90.2%. Socio-demographic factors were not significantly correlated with decision making capacity. It has been decided that the MMSE can be used as a screening test for rapid clinical estimation of legal capacity in patients suffering from Alzheimer's disease.[9]

In the Belgrade study, the average age of examinees

was 82 years. Out of total number of 148 inmates, 75% were women, and average MMSE score was 14. Average value of total MMSE score of participants with no guardianship was 20; of those with temporary guardianship it was ten, whereas average value of total MMSE score of study participants with full guardianship was 12. There is a statistically significant difference in values of total MMSE score between the examined groups ($F=19.847$; $DF=2, 145$; $p=0.001$). Statistically significant difference in values of total MMSE score was found between examinees with no guardianship in relation to examinees with temporary guardianship ($p=0.001$) and those with full guardianship ($p=0.001$). Between examinees with temporary guardianship and those with full guardianship, no statistically significant difference in values of total MMSE score was found ($p=0.329$). Examinees with no guardianship had significantly higher values of total MMSE score than examinees with temporary guardianship and those with full guardianship. The temporary guardianship was predominant in men (40.5%), while women were mostly with no guardianship (44.1%). Between the examined groups, there is statistically significant difference in frequency rate of gender ($\chi^2=9,661$; $p=0.08$).

Average age of examinees without guardianship was 84 years, with temporary guardianship 83 years, whereas the average age of examinees with full guardianship was 77 years. There was statistically significant difference in average age between the examined groups ($F=6.723$; $DF=2, 145$; $p=0.002$). Statistically significant difference in average age was found between examinees with full guardianship in relation to examinees without guardianship ($p=0.001$) and with temporary guardianship ($p=0.012$), while there was no statistically significant difference in age ($p=0.683$) between the examinees with no guardianship and those with temporary guardianship. Examinees with full guardianship were significantly younger than examinees with no guardianship or those with temporary guardianship.

Perceived socio-demographic differences between this study and the studies carried out in the USA and Europe are probably due to expected shorter life-span in Serbia in comparison with mentioned countries, as well as to the lower institutionalisation rate in our country. General impression is that in our sub-culture, families or guardians have difficulties to come to a decision for institutionalisation, and this is for various reasons: lower purchasing power, state of mind, low degree of confidence in institutionalisation, etc.

This study analysed correlation between each of these capacities in examined subjects with decision making capacity, i.e. with the status of limited or full guardianship protection. On each item of the MMSE test, except constructional praxia, the study participants with no

guardianship, i.e. the persons with formally full legal capacity, have significantly higher median scores than inmates with some type of guardianship protection (temporary or full). To date, no other studies that made assessment of special cognitive capacities of persons under guardianship protection by using the MMSE were found in literature; thus, comparison with the results of our study was not possible.

The increase of the institutionalisation rate in the last ten years implies the increased number of cases with exigency to reassess mental capacities of persons with dementia. This opens the question if such an encumbrance of courts of law is justified. There is a real need to revise the entire legislation relative to this problem. The increase in number of cases entails the increase in time duration of procedure. The costs that family or other proponents of the procedure undergo are getting higher, and the procedure of accommodation of the subject person is postponed itself. Moreover, it is not uncommon that the encumbrance of judges leads to some procedural flaws, such as: non-attendance of judge when expert opinion is being given, uneven quality of legal representation of the proponent's opponent, scarce use of the institution of legal capacity partial deprivation, superficiality in explanation of decision on legal capacity deprivation, etc.;[16] all that can call into question the quality of arbitration, and consequently, possibly deprive proponent's opponent of basic human rights.

One of the possible solutions that should be taken into consideration within expert circles, and not without a wide and enough long public discussion is implementation of procedure in competent centres for social casework. The procedure could be implemented through administrative procedure; this assumes creation of expert teams on the level of competent centres for social casework, and upon findings and opinion given by authorised adept specialist in psychiatry.

Developed countries, such the USA, face almost identical problems and difficulties. Namely, key questions that relate to reassessment of legal capacity are subject of debate in the USA. American authors took apart three key questions: How often appear problems of reasoning and decision making? How big is the encumbrance of this phenomenon frequency on low courts? Is it necessary to create wide-range teams beyond court practice, which could help the court decision with their decisions and assessments? The lack of exact procedures for assessment of decision making capacity is emphasised as the key problem.[17,18]

Doctor's opinion continues to be clinical standard for recognition of an individual's competency. However, this kind of assessment can sometimes be subjective and inconsistent. What is common for this study and other

similar studies carried out worldwide is the fact that the level of cognitive impairment, or total MMSE score, correlates significantly with capacities of decision making and own interest supporting, i.e. with subjecting under any type of guardianship. Thus, the possibility of applying this instrument in order to make more exact assessment of decision making capacity should be seriously taken into consideration.

Study limitations

The fact that study participants have been selected solely on one welfare institution is the potential limitation of this work. Also, the definition of a great institution for accommodation and care that has high quality level of services can, in itself, open the question of how representative is the sample. In other words, this type of institution accommodates people of higher social status, who are capable to finance a wide range of services of the social welfare and healthcare protection domain.

Another possible limitation is disregard of the data considering the time length of accommodation of some inmates. The study involved and equally treated inmates with the residence time from seven years to less than one month. The users accommodated in institution in the moment of their "full" legal capacity were "loosing" cognitive capacities with time. However, for the family comfort on the one hand, and the lack of real problems (settled property-rights relations, only one legal heir, full participation of family in all the aspects of social and healthcare protection, etc.) on the other hand, there has been no reassessment of their legal capacity, and that was evidently needed.

The third potential limitation of this study is unequal implementation of diagnostic criteria for the diagnosis of dementia in inmates who were subjects of the study. What are missing in certain files are a neuro-visualisation, and other auxiliary diagnostic methods.

The fourth limitation of the study is the fact that the groups of study participants with full guardianship and with temporary guardianship were examined as single group – examinees under guardianship – in the final analysis of data. That is the consequence of uneven practice of competent centres for social casework, which creates situation that some of those centres go for decision on temporary guardianship, based on dementia diagnosed by competent health institution (when it is about accommodation, withdrawal and disposal of money), whereas the others direct families to the competent court of law and procedure for legal capacity assessment.

Remark: This paper is an integral part of the final paper in subspecialty of forensic psychiatry, defended in Belgrade School of Medicine, on 15.04.2014, titled "Demographic characteristics, correlated diagnosis and

cognitive status of persons under guardianship, accommodated in welfare institution”.

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