EUROPEAN HUMANITIES STUDIES:
State and Society

EUROPEJSKIE STUDIA
HUMANISTYCZNE:
Państwo i Społeczeństwo

2
2016
Currently, Ukraine is in the situation described by Emile Durkheim, who said that a society lacking “distinct regulation of individuals’ behavior contains moral vacuum, when the previous standards and values do not comply with the new relations, and the new ones have not formed yet” [1]. Due to this, clear disorganization of several social institutions takes place, which results in deterioration of the quality of a human’s public and social adaptation in the society. Apparently, the crisis condition of the society as a whole could not but impact the state of the family. Family crisis is, first of all, personality crisis resulting in regression of family social function.

A family in socially hazardous conditions is frequently encountered with medico-biological disorders and even pronounced diseases preventing the normal full-fledged family functioning.
According to the results of global medical statistics, there are 600 patients with cerebrovascular pathology (CVP) consequences per every 100000 of the population; 60% of such patients become disabled [2]. During the last 30 years, decrease of stroke-related morbidity and mortality rates is observed in the USA, Japan, and many other countries [3]. Thus, in Australia, cerebrovascular accident (CVA)-related mortality rate was decreased by more than 70% for the period from 1967 till 1992. Active implementation of primary prevention is interpreted by the investigator as the main cause of successful CVP control [4]. In Ukraine, CVA-related morbidity and mortality rates have been increasing; cerebrovascular pathologies represent one of the main causes of mortality during the recent 25-30 years (N.V. Vereshchahin, V.A. Morhunov, T.S. Hulevskaia, 1997 [5]; B.S. Vilenskyi, 1999 [6] et al.).

The problem of chronic CVP, due to its high prevalence, predominant affection of able-bodied persons on the initial disease stage, as well as severe medico-social consequences, holds one of the leading positions in national neurology and psychiatry. Correct diagnostics and therapy of this disease belong to first-priority tasks aimed to prevent progression of the disease and decrease the risk of stroke and dementia development [7].

Various political, economic, cultural, and social transformations in Ukraine result in deterioration in the condition of the majority of population. Social conflict becomes an integral part of the life of a modern human, thus provoking the formation of emotional social stress causing dysfunction of many organs and systems.

Family is a social unit, which is why its function is affected by all social-economic, cultural, and political processes (both positive and negative) occurring in it. Family and its moral state are directly affected by social environment factors, phenomena we observe in work collective, at the place of residence, and in daily life [8]. Evaluation of the situation occurring in the country forces us to review a woman’s role in the family, as well as its realization in modern life conditions. Doubtless, in the situation of stability in the family, in relations between spouses, with strong confidence in the future, a woman feels confident and secured, which represents a good protection against stress, causing cognitive and emotional disorders.

One of the leading syndromes at the initial disease stage is represented by cognitive and emotional disorders, more pronounced in women. Vascular cognitive and emotional disorders, even those not reaching the intensity of dementia, are developed as a consequence of
long-term pathological process and mark a cerebrovascular disorder of considerable intensity. They are indicative of an essential failure in brain blood supply, and thus should be viewed as an indicator of high risk of stroke or vascular dementia [7]. Psychic disorders, first of all, cognitive and emotional ones, are among the most frequent manifestations of organic brain disorders. Loss of psychological equilibrium as affected by social stress, loss of perspectives in the family determines the potential development of depression, phobia, anxiety, and, eventually, formation of pathological damage of brain vessels followed by acute stroke [9].

Emotional and cognitive disorders are among the most urgent problems of modern medicine and psychology; study of their development mechanism allows identifying risk factors resulting in cerebrovascular accidents in able-bodied women in early stages [10]. Emotional and cognitive disorders have minimum intensity in patients with initial CVP stages, which is why their diagnostics represents a rather complicated task. CVP, including a rather pronounced one, may be manifested for a time only in the form of cognitive and emotional disorders. That why evaluation of emotional condition requires special attention in diagnostics of chronic cerebrovascular deficiency [7].

Due to the fact that CVP consequences rather frequently include fatal outcome or disability of women of various social groups and various establishment of CVP risk factors and CVP prevention represent a current problem of modern medicine (F.Ye. Horbachova et al., 2004 N.V. Vakhnina, L.Yu. Nikitina, V.A. Parfenov, N.N. Yakhno, 2008 et al.).

Stress condition transforms the family institution, and this transformation brings about more negative consequences that positive. In such a family, a woman can not realize herself as a full-fledged personality; not only her family members, but her whole environment is affected from that.

The goal of this study was a comparison of groups of women in families without any crisis manifestations in relations between spouses, and women living in crisis families, as well as identification of factors affecting relations between spouses, which may improve divorce fiction quality, timely provision of the necessary aid in the correction of these relations, and, certainly, should be helpful in identifying CVP development probability.

Our key task was the creation of mathematical model allowing to estimate the probability of crisis development in a family. Various
statistical models may be used for assessment of this probability, but the logistic regression model has recently become the most widespread in practice.

We examined 350 individuals for identification of risk factors. Women participating in the study were divided into two groups: the first group (126 individuals) included women having no crisis in relations, and the second group (224 individuals) included women in crisis. Dependant variable in logistic regression model was belonging of the examined individuals to one of these groups. Independent data included all parameters of tests and questionnaires previously passed by the study subjects.

Tests and questionnaires were divided into five blocks: marriage satisfaction block – "Marriage Satisfaction" test; family crisis block – diagnostics of possible behavioral choices in conflict situations according to Thomas (5 scales), sexual attitude questionnaire (14 scales), love and sympathy scale (2 scales), UEA questionnaire (understanding, emotionality, authority) (3 scales); psychoemotional condition block – psychopathological symptoms intensity questionnaire (11 scales); psychosocial stress scale, hospital anxiety and depression scale (2 scales); personal block – Kettel’s personal questionnaire (16+4 scales), way out of hardships, lifestyle index (8 scales), subjective control level (2 scales); self-realization block – self-actualization test (14 scales). Thus, 8 psychological parameters were evaluated at the study step.

In order to pick the most informative signs, selection was carried out according to forced inclusion principle, when all independent variables are simultaneously taken into account. The step-by-step algorithm selected the predictors with specification of a just prediction percentage levels and values of coupling coefficient. 7 ones essential for classification were picked: X1 – trustfulness-suspiciousness, X2 – straightforwardness-diplomacy, X3 – intro-extraversion, X4 – anxiety, X5 – depression, X6 – psychosocial stress parameter and X7 – uneasiness-adaptation, allowing to determine the presence or the absence of crisis in interpersonal relations.

The resulting binary logistic function looks as follows:

$$P = \frac{e^{(-19.260 + 0.819X_1 + 0.499X_2 + 0.936X_3 + 0.461X_4 + 0.938X_5 - 1.529X_6 + 1.603X_7)}}{1 + e^{(-19.260 + 0.819X_1 + 0.499X_2 + 0.936X_3 + 0.461X_4 + 0.938X_5 - 1.529X_6 + 1.603X_7)}}$$

where P – probability of the presence of crisis in family relation between spouses.

Thus, comparison of the described groups has allowed us to identify
statistically relevant factors affecting the probability of crisis development in a family.

Verification of relevance of selected coefficients $B_i$ was carried out using Wald statistics. All the variables were significant ($p<0.001$) and were selected correctly.

Characteristics of the obtained binary logistic regression model are shown in table 1.

**Table 1**
**Characteristics of the model developed to determine the probability of the risk of family crisis**

<table>
<thead>
<tr>
<th>Final evaluation step results</th>
<th>-2 Log-probability (G)</th>
<th>Cox &amp; Snell’s R-square</th>
<th>Nagelkerke’s R-square</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>103.140*</td>
<td>0.637</td>
<td>0.873</td>
</tr>
</tbody>
</table>

As can be seen from the table 1, the value obtained in the study was $G=103.140$, therefore, generally, independent variables make an essential contribution to predict a dependent variable. Two other parameters in table 1 are the measures of determination, indicative of the fact that the part of dispersion interpretable using logistic regression comprises 87.3%.

Evaluation of the capability of the logistic regression model was performed based on classification table evaluation (table 2).

**Table 2**
**Classification results**

<table>
<thead>
<tr>
<th>Observed groups</th>
<th>Predicted results</th>
<th>Percentage of correctly predicted parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>no crisis</td>
<td>family crisis</td>
</tr>
<tr>
<td>no crisis</td>
<td>115</td>
<td>11</td>
</tr>
<tr>
<td>family crisis</td>
<td>7</td>
<td>217</td>
</tr>
<tr>
<td>Total parameter</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
It can be concluded from table 2 that, among the total number of subjects classified as those having crises in family relations, comprising 224 women, 217 were correctly recognized by the test and 7 were erroneously assigned to a group having no crisis. The test correctness is 96.9%. And, accordingly, in a group having no crisis between spouses comprising 126 women, correctness were confirmed by the test in 115 cases, and the result was erroneous in 11 cases. The test correctness is 91.3%. Thus, in general, 332 out of 350 cases were recognized correctly, which means accurate calculation of the presence of crisis in family relations between spouses in 94.9% of the cases.

Classification results are depicted as a diagram in figure 1.

Figure 1 – Classification diagram.

Symbols: h – no crisis; c – presence of family crisis

The separation point is the value p=0.5.

The values of the predicted probability of crisis occurrence in a family calculated from regression equation are plotted along the horizontal axis, and their frequencies are plotted along the vertical axis. Each column on a diagram conforms to a certain predicted probability, and its height conforms to the number of objects for which the said probability is predicted. The closer the predicted probability value of 1 is, the more probable crisis development in family relations is.

Total assessment of agreement between the effects of the parameters identified in the model and actually registered occurrence of an unfavorable outcome was carried out using the Hosmer-Lemeshow
goodness-of-fit test (HL), where, the less are the differences between the frequency of outcomes actually observed and predicted using this model, the higher p value is (table 3).

Table 3. 
Hosmer-Lemeshow test

<table>
<thead>
<tr>
<th>Step</th>
<th>Test (Hi.)</th>
<th>Degree of freedom</th>
<th>Significance (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6.287</td>
<td>8</td>
<td>0.615</td>
</tr>
<tr>
<td>2</td>
<td>7.418</td>
<td>8</td>
<td>0.492</td>
</tr>
<tr>
<td>3</td>
<td>7.862</td>
<td>8</td>
<td>0.447</td>
</tr>
<tr>
<td>4</td>
<td>7.058</td>
<td>8</td>
<td>0.530</td>
</tr>
<tr>
<td>5</td>
<td>4.165</td>
<td>8</td>
<td>0.842</td>
</tr>
<tr>
<td>6</td>
<td>2.030</td>
<td>8</td>
<td>0.980</td>
</tr>
<tr>
<td>7</td>
<td>1.521</td>
<td>8</td>
<td>0.992</td>
</tr>
</tbody>
</table>

Low Hosmer-Lemeshow value HL=1.521 obtained in the last step with a probability level p>0.05 (p=0.992) is indicative of high quality of the selected model.

Besides, ROC-analysis was used for assessment of the model efficacy. The results of the ROC-analysis are shown in table 4 and figure 2.

Table 4
ROC-analysis results

<table>
<thead>
<tr>
<th>ROC-curve characteristics</th>
<th>Asymptotic 95% confidence interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area</td>
<td>Standard error</td>
</tr>
<tr>
<td>0.941</td>
<td>0.016</td>
</tr>
</tbody>
</table>
The value of the area under the curve was 0.941.

ROC-analysis of the obtained regression model has identified its characteristics indicative of its excellent quality.

Conclusions

Thus, the comparison between groups of women living in families without any crisis manifestations in relations between spouses and in crisis, families was carried out, and, based on the data obtained, factors affecting the relations between spouses were identified.

The resulting mathematical model allows, based on determination of various psychological parameters of a family, to classify it as a crisis or a non-crisis one, or to evaluate probability of crisis. Timely identification of factors determining the probability of crisis in family relations should allow predicting onset and development of cerebrovascular pathologies leading to disability and even fatal outcomes.

The results obtained in this study are indicative of the importance of family crisis prediction and may be useful for neurologists and psychologists working with crisis families.

References:


Transliteration of References:
5. Vereshagin N.V. The pathology of the brain in atherosclerosis and hypertension.
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LIUBOV RYSOWANA, OLENA WYSOCKA, ANDRII PORVAN, ROMAN ALEKSEJENKO. Badanie nad powstaniem kryzysu w rodzinie: analiza regresji. Artykuł poświęcony jest badaniu nad procesem powstawania kryzysu w rodzinie. Badania porównawcze zostały przeprowadzone na grupie kobiet, które żyją w rodzinach bez kryzysowych przejawów w stosunkach między małżonkami oraz w rodzinach będących w stanie kryzysu. Ustalono czynniki, wpływające na stosunki między małżonkami, które pozwalają zwiększyć stopień prognozowania rozwodów i we właściwym czasie nadawać niezbędną pomoc w celu korekcji tych stosunków. Na podstawie kompleksowej analizy danych opracowano model oceny ryzyka powstania kryzysu w rodzinnych stosunkach, który pozwala na podstawie różnych psychologicznych wskaźników określić poziom występowania kryzysu. Zdobyte wyniki świadczą o istotnej roli prognozowania kryzysu rodzinnego i mogą być pożyteczne dla psychologów, pracujących z rodzinami będących w stanie kryzysu. Kluczowe słowa: kryzys w rodzinie, stosunki rodzinne, analiza regresji, logistyczna regresja, model.

ЛЮБОВ РИСОВАНА, ОЛЕНА ВИСОЦЬКА, АНДРІЙ ПОРВАН, РОМАН АЛЕКСЕЄНКО. Дослідження процесу виникнення кризи в сім'ї на основі регресійного аналізу. Робота була при­свячена дослідженню процесу виникнення кризи в сім'ї. У ході дано-
го дослідження було проведено порівняння груп жінок, що живуть у сім'ях з відсутністю кризових проявлів у відносинах між чоловіками і у кризових сім'ях, а також виявлені фактори, що впливають на відносини між подружжям, які дозволяють підвищити якість прогнозування розлучень і своєчасне надання необхідної допомоги в корекції цих відносин. На основі комплексного аналізу даних була розроблена модель для кількісної оцінки ризику виникнення кризи в сімейних відносинах, яка дозволяє на основі визначення різних психологічних показників сім'ї віднести її до одного з класів (кризова – не кризова) або оцінити ймовірність кризи. Отримані в даному дослідженні результати, свідчать про важливість прогнозування сімейної кризи й можуть бути корисні для психологів, що працюють із кризовими сім'ями.

Ключові слова: криза в сім'ї, сімейні відносини, регресійний аналіз, логістична регресія, модель.

ЛЮБОВЬ РИСОВАНАЯ, ЕЛЕНА ВИСОЦЬКА, АНДРЕЙ ПОРВАН, РОМАН АЛЕКСЕЕНКО. Исследование процесса возникновения кризиса в семье на основе регрессионного анализа. Работа была посвящена исследованию процесса возникновения кризиса в семье. В ходе данного исследования было проведено сравнение групп женщин, живущих в семьях с отсутствием кризисных проявлений в отношениях между супругами и в кризисных семьях, а также выявлены факторы, влияющие на отношения между супругами, что позволяет повысить качество прогнозирования разводов и своевременное оказание необходимой помощи в коррекции этих отношений. На основе комплексного анализа данных была разработана модель для количественной оценки риска возникновения кризиса в семейных отношениях, которая позволяет на основе определения различных психологических показателей семьи отнести ее к одному из классов (кризисная – не кризисная) либо оценить вероятность кризиса. Полученные в данном исследовании результаты, свидетельствуют о важности прогнозирования семейного кризиса и могут быть полезны для психологов, работающих с кризисными семьями.

Ключевые слова: кризис в семье, семейные отношения, регрессионный анализ, логистическая регрессия, модель.

LIUBOV RYSOVANA, OLENA VYSOTSKA, ANDRII PORVAN, ROMAN ALEKSEENKO. Family Crisis Investigation on the Basis of Regression Analysis. The paper presents the results of the investigation.
of family crisis emergence. In this study the comparative analysis of two
groups of women, those who live in families without crisis manifestation
in the relationship between spouses and women living in crisis families,
was conducted. The factors influencing the relations between the spouses
that can improve the quality of the divorce prediction and determine the
necessity to provide timely assistance were identified. As the result of data
complex analysis the model to quantify the risk of a crisis in family relations
has been developed. On the basis of different psychological factors this model
provides the possibility to relate a family to one of the following classes –
crisis or non-crisis – or to estimate the probable risk of a family crisis. The
data obtained in the investigation prove the importance of a family crisis
prediction and can be of particular interest to psychologists working with
crisis families.
Key words: family crisis, family relations, regression analysis, logistics
regression, model.
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