Within this study 117 drug and alcohol addicts (97 males and 20 females) were compared with a matching group of healthy controls. All respondents were questioned regarding negative life events (NLE) that have happened to them during different periods of their life, in particular when they were 0-6, 7-14, 15-18 and 19 and more years old. The questionnaire consisted of 69 questions which covered such issues as “assault”, “divorce/separation”, “major financial problems”, “serious illness or injury”, “legal problems”, “loss of confidant”, “serious marital problems”, “being robbed”, “serious difficulties at work”, “serious housing problems” and “job loss”, etc. Events related to the personal network and early life period included death of a parent, loss of an individual in the network, alcohol and drug addiction of a parent, problems in relations with parents, separation from parents, being brought up by persons other than parents, housing problems, having very bad relations with a parent, etc. It was found that the life course of NLE accumulation in addicts is 3 times higher than in controls, the differences were statistically significant (p<0.001) in all life periods. In the hierarchical regression model which was used, accumulation of NLEs in the early childhood and young adulthood (after 19) have a bigger impact than periods of school years and adolescence. Analysis of NLEs in the earliest life period (0-6 years) in addicts showed that alcohol problems in parents and perceived feelings that parents do not love them and even torture them emotionally were much more frequent than in controls. Other strong associations were with being brought up by people other than parents and father’s addiction. Physical and sexual violence were not among the priorities and were not so strongly associated with addiction. The results are discussed in terms of possible cultural peculiarities than may influence prioritization of childhood adversities and their relevance for further development of addictive behavior. The results obtained may be helpful while building rehabilitation measures for addicts, especially during family therapy.

Keywords: alcohol and drug addiction, life stress, negative life events, early life adversities, psychological trauma, parent-child relations

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**Introduction**

Alcohol and drug abuse is a major public health problem worldwide. Recent WHO report states that in 2016 more than 3 million deaths in the world were associated with the harmful use of alcohol, 75% of them were among men. It is estimated that about 5% of the global disease burden may be the result of alcohol harmful use [1]. In addition, due to the UN report, roughly 450,000 people died as a result of illegal drug use in 2015. About 167,000 of those deaths were overdoses, while the rest were due to morbid consequences of HIV and hepatitis C acquired through unsafe injecting practices [2]. Better understanding of the complex pathways leading to alcohol and drug abuse and addictions may lead to better prevention of this type of deviant behavior and, quite possibly, of the associated public health problems and mortality.

Recent clinical observations and animal studies suggest that chronic and acute psychosocial stress may be serious drivers of addictive behavior, either by involving a coping self-medication mechanism, or in a more complex way, as a result of the neuroadaptation process that triggers complex circuits regulating reward, craving, loss of control and compulsion [3]. It has been long known from clinical and population studies that a high level of life stress (usually measured as accumulation of negative life events, NLE) is associated with different mental health disorders and psychopathologies, including addictions [4]. In confirmation, experiencing maltreatment and cumulative stressful life events prior to puberty and particularly in the first few years of life is associated with early onset of problem drinking in adolescence and alcohol and drug dependence in early adulthood [5]. In a population study significant associations between exposure to childhood adversity (emotional and physical violence or parental neglect) and past year stressful life events predicted disordered drug use [6]. Moreover, early life stress may result in comorbidity, for instance in co-occurrence of alcohol addiction and PTSD [7]. Recent studies have established that accumulation of different types of severe early life adversities, like the loss of a parent, parental neglect or physical and sexual assault, may lead to substance abuse and other mental health problems later in life by triggering biological mechanisms of stress reactivity of the personality [8].

On the other hand, specific traumatic events that have the biggest influence on the probability of development of addictions during the process of personality development and socialization may differ in different cultures making relation between stress and psychopathologies more complex [9]. Though questionnaires assessing life stress in different life periods are presenting a standard set of possible NLEs, existing cultural, religious and psychological peculiarities may influence the results when it comes about linking life stress to specific psychopathological outcomes. For instance, social contexts, interactions with parents and peers, as well as traditions and habits of drinking, influence such outcome as alcohol addiction [10].

Therefore, it is of particular interest and importance to know the frequency of stressful life events in the early childhood and to understand the priority of these events as determinants of addictive behavior in each population and in specific cultural environment. Knowing these details may be useful for better understanding of the roots of addiction in the given human community, ethnos or social group, as well as for developing meaningful approaches to psychological treatment and rehabilitation. In this paper we have studied the role of early adversities in life and especially potential traumatic life events as factors of addictive behavior in a mixed Russian-Ukrainian population in the city of Odessa (South of Ukraine).

**Methods**

To achieve the goal of the study 2 groups of people were recruited. 1) A group of addicts (N=117), of them 101 people with various illegal drugs dependence (mostly methadone, heroin, amphetamines) and 16 people with alcohol dependence. All of them at the moment of the study were attending the “12 Steps” rehabilitation program in the Odessa AlAnon community center “STEPS” (http://stupeni.org/). Among them there were 97 males and 20 females. 2) A group of healthy controls, also 97 males and 20 females. Inclusion criteria were age over 18, exclusion criteria were admitting treatment or rehabilitation for the reason of substance abuse at any time in life, for women – also pregnancy or lactation. Socio-demographic data for the studied groups are summarized in Table 1.
very bad relations with a parent, etc. Each question was designed in such way, that it clarified what happened and in which respondent’s life period it happened (0-6 years, 7-14, 15-18 and 19 years or older).

Evaluation of the NLE Questionnaire included calculation of the total score of NLE (sum of life events – SUMLE), which was performed with the use of the special software utilizing the coefficient of the relative negative value of each event. This was evaluated previously on the basis of the analysis of responses of suicide attempters regarding relevance of each event for attempting suicide [11]. Also qualitative analysis of the character of the events was performed in both studied groups with subsequent prioritizing of the event and evaluation of the associations of specific events with the addictive behavior. For statistical analysis standard variation methods were used where appropriate. For group comparisons one factor dispersion analysis was used. Associations were evaluated using K Kramer coefficient, and predictive value of NLE accumulation regarding addictive behavior was evaluated in the simple and hierarchical linear and logistic regression models. For these purposes IBM SPSS Statistics 22.0.0 software was applied.

The study was performed in accordance with the existing ethical standards and the Helsinki Declaration. All respondents were asked to fill the Negative Life Events (NLE) Questionnaire that was developed for the purposes of the genetic study GISS implemented in Ukraine [11]. The questionnaire consisted of 69 questions, which were selected from the Composite International Diagnostic Interview (CIDI), core version 2.1, section K (post-traumatic stress disorder), and from the European Parasuicide Study Interview Schedule used in the WHO/EURO Multicentre Study on Parasuicide [12]. The questions covered the same NLEs that were used in other studies [13], namely “assault”, “divorce/separation”, “major financial problems”, “serious illness or injury”, “legal problems”, “loss of confidant”, “serious marital problems”, “robbed”, “serious difficulties at work”, “serious housing problems” and “job loss”, etc. Such potentially traumatic events such as direct experience with combat and war, involvement in a life-threatening accident, involvement in a fire, flood, or natural disaster, witnessing of someone being seriously injured or killed, subjection to serious physical assault or violence, threatening with a weapon, kidnapping, tortures, targeting by terrorists, suicides and suicide attempts of relatives, other causes of relatives deaths, admission of relatives to a psychiatric hospital and their suffering from a chronic somatic diseases, etc. were included. Events related to the personal network and early life period were also included, namely the death of a parent, loss of an individual in the network, alcohol and drug addiction of a parent, problems in relations with parents, separation from parents, being brought up by persons other than parents, housing problems, having

| Table 1. Socio-demographic data of the studied groups |
|-----------------------------------------------------|
| Group studied                                      | Males | M  | SD  | Females | M  | SD  |
| Addicts (N=117)                                    |       |    |     |         |    |     |
| Drug users (N=101)                                 | Age   | 28,5| 5,29| Age     | 29,3| 8,01|
|                                                    | Years of schooling | 14,0| 2,81| Years of schooling | 14,1| 4,86|
|                                                    | Married/cohabitation | 40,3% |     | Married/cohabitation | 53,3% |     |
| Alcohol abusers (N=16)                             | Age   | 34,5| 11,92| Age     | 39,7| 8,49|
|                                                    | Years of schooling | 15,5| 6,46| Years of schooling | 16,0| 4,42|
|                                                    | Married/cohabitation | 54,5% |     | Married/cohabitation | 33,3% |     |
| Controls (N=117)                                   | Age   | 22,2| 5,37| Age     | 26,4| 12,42|
|                                                    | Years of schooling | 14,3| 4,46| Years of schooling | 15,3| 7,19|
|                                                    | Married/cohabitation | 9,5% |     | Married/cohabitation | 50,0% |     |
Results

We have calculated the total SUMLE score for the whole life, and the number of NLEs in different life periods (quantitative characteristics). It should be noted that distribution of SUMLE in addicts was close to normal, while in controls it was skewed in the direction of lower values. Quite expectedly total SUMLE score in addicts (M=43,957; SD=16,851) was more than 3 times higher than in controls (M=16,957; SD=13,515), the mean difference was statistically significant (d=1,775; F=182,793; p<0,001). The same regularity was found when the number of NLEs was calculated for different life periods (Table 2). It is noteworthy that in addicts the number of NLEs was growing in each subsequent period of maturation, while in controls it dropped slightly after the period of adolescence, therefore the difference grows in older groups (table 2). The mean difference between groups was statistically significant in all studied life periods that were estimated by ANOVA.

We have evaluated the predictive value of NLEs accumulation in each life period (independent variables) regarding the risk of addictive behaviors (dependent variable) using simple regression (Table 3) and hierarchical regression models (Table 4 and 5). As can be seen, in the linear regression model number of NLEs in all investigated life periods predicts the probability of addictive behavior, which is consistent with existing studies [14]. In our model NLE score accumulated in each life period (early childhood, school age, adolescence and young adulthood) predicted addictive behavior with the growing probability, NLEs after 19 years being the strongest predictor, as can be seen from $R^2$ and Pseudo-$R^2$ values (Table 3).

When the hierarchical regression model was used (which shows the influence of added NLEs accumulation for each life period) it is obvious that the period of early childhood and young adulthood (after 19) have a bigger impact than periods of school years and adolescence. This was true both for the linear and logistic regression models (Table 4 and 5). Thus, the results obtained suggest that adversities during early childhood (0-6 years) and after graduation from secondary school have a more strong impact regarding the probability of addiction. It is also in consistence with the data that exposure to childhood adversity and past year stressful life events predicted disordered drug use with the high probability of chronic addiction development [6].

In further analysis we have concentrated on the early life period and looked at the frequencies of specific NLEs when respondents were 0-6 years old, i.e. in early childhood, when the child is fully dependent on the parents. We have selected 10 most frequent events for further qualitative analysis. As can be seen from Table

| Life periods (years) | Addicts (N=117) | Controls (N=117) | Mean difference | Cohen's d | F-test | p       |
|---------------------|----------------|-----------------|----------------|-----------|--------|---------|
| 0-6                 | M=5,274 SD=4,582 | M=1,726 SD=2,402 | 3,548          | 0,974     | 55,002 | <0,001  |
| 7-14                | M=11,906 SD=8,218 | M=3,949 SD=4,187 | 7,957          | 1,225     | 87,088 | <0,001  |
| 15-18               | M=15,009 SD=9,014 | M=4,359 SD=4,757 | 10,65          | 1,484     | 127,739 | <0,001  |
| 19 and more         | M=17,600 SD=8,950 | M=4,034 SD=5,019 | 13,566         | 1,878     | 204,481 | <0,001  |

| Life period (years) | $R^2$ | $R^2$ adjusted | Pseudo-$R^2$ Cox-Snell | Pseudo-$R^2$ Nagelkerke |
|---------------------|-------|---------------|------------------------|------------------------|
| 0-6 years           | 0,192 | 0,188         | 0,216                  | 0,288                  |
| 7-14 years          | 0,273 | 0,270         | 0,296                  | 0,395                  |
| 15-18 years         | 0,355 | 0,352         | 0,371                  | 0,495                  |
| ≥19 years           | 0,468 | 0,466         | 0,453                  | 0,604                  |
ed about being involved in a life threatening accident, death of a close person, being separated from parents for a year or more (a rather typical situation in Ukraine where parents often work abroad leaving children in the care of their grandparents) and suffering from any physical illness that (might have) meant serious deformity or incapacity. This list gives an impression of rather typical life stressors inherent to any family situation, while NLEs in addicts are mostly provoked by alcohol problems in parents and perceived feelings that parents do not love and even torture emotionally. On the other hand it is interesting that early physical and sexual abuse, which are often reported as the main reasons for a variety of mental health problems and disorders later in life, are not present among the first 10 priority NLEs.

The next step of the analysis was the evaluation of association of specific events at the age 0-6 years with addiction. Results of this analysis using Cramér’s V measure of association are presented in Figure 1. It is very characteristic that being emotionally and psychologically tortured by the father and mother appeared to have strongest associations (V exceeding 0.300, d exceeding 0.629, which is a high association, p<0.001). Next associations were with being brought up by persons other than parents and father’s addiction (V exceeding 0.250, d exceeding 0.516, p<0.001).
Table 6. Frequencies of specific NLE at age 0-6 in addicts as compared with controls

| Addicts                                      | % | Controls                                      | % |
|----------------------------------------------|---|-----------------------------------------------|---|
| Father and mother having serious relationship problems with each other | 35.9 | Father and mother having serious relationship problems with each other | 21.4 |
| Father was addicted to alcohol or drugs      | 29.9 | Parents being divorced or separated           | 17.1 |
| Being brought up by persons other than parents | 27.4 | Parents being away from home for long periods | 14.5 |
| Being emotionally or psychologically tortured by the father | 23.9 | Parents having serious financial problems     | 13.7 |
| Parents having serious financial problems    | 22.2 | Father was addicted to alcohol or drugs       | 9.4  |
| Being emotionally or psychologically tortured by the mother | 21.4 | Being involved in a life threatening accident | 6.8  |
| Close person was addicted to alcohol or drugs | 17.1 | Death of a close person                       | 6.8  |
| Parents being divorced or separated          | 17.1 | Being separated from parents for a year or more | 6.8  |
| Parents being away from home for long periods | 15.4 | Being brought up by persons other than parents | 6.8  |
| Often thought that parents did not love him/her and did not want to take care of him/her | 15.4 | Suffering from any physical illness that (might have) meant serious deformity or incapacity | 6.8  |

Figure 1. Association of NLE in the early childhood with addiction, Cramér’s V (explanations are in the Table 6 legend and in the text).
Next four and lower associations (V exceeding 0.200, d exceeding 0.408, p=0.001) were with such events as being seriously physically attacked or assaulted, thinking that parents did not love a respondent and did not want to take care of him/her, having such a bad relationship with one of the parents that respondent hated him/her and experiencing a failure to achieve an important goal (fig.1). Looking at other associations it is worth mentioning the physical assault by mother (V=0.200, d=0.408, p=0.002), loneliness for a long period of time (V=0.182, d=0.370, p=0.005) and physical attack and assault by father (V=0.176, d=0.358, p=0.007). Other even lower associations (V ~ 0.150) were with such events, as being neglected by caregivers, mother being addicted to alcohol, father being imprisoned, somatic illness of a father, experiencing stressful and life-threatening event, accident, or being a witness of an accident. These associations give an impression of being brought up in an unsecure environment with a high probability of different risks. It is necessary to mention that sexual abuse (being sexually molested, that is, when someone touched your genitals when you did not want them to) had a rather low association, though statistically significant (V=0.148, d=0.299, p=0.024), and was in the 24th position (from the general list of 28 statistically significant associations).

Discussion

Our study confirms that addictions, both drug and alcohol dependence, are associated with a higher life stress. It can be seen that the lifetime accumulation of NLEs in the group of addicts is almost three times higher than in control subjects, who have never been treated or rehabilitated for any type of addiction. It is interesting to mention that the biggest differences were seen between the accumulation of NLEs in the periods of maturation, especially after 18 years of age, though existing differences between groups may contribute to it (see Limitations of the study). Chronic stress is a potent factor of addictive behavior – as a systemic reaction of the organism it involves deep neurobiological mechanisms that may eventually trigger self-narcotization [3]. On the other hand, the psychology of such stress is complicated; it involves conscious and unconscious impulses, based on very deep feelings and emotions, stemming from early childhood. It should be noted that in spite of the global and chronic character of the modern psychosocial stress majority of the people that consume alcohol in different social situations retain quite efficient control over consumption. The main question is what makes some people different and what leads to the loss of control and dependence. Many studies have already established that early life stress (early life adversities, like the loss of a parent, physical and sexual abuse) may lead to different psychopathologies, including drug and alcohol abuse, thus providing a plausible explanation [5]. Our study provides a more detailed data about the character of the most dangerous events that are associated with addictive behavior in a specific cultural environment.

It should be noted that early life events and adversities that happened in the earliest life periods may fall within the so-called sensitive periods, during which the development of critical brain structures is especially vulnerable and this may lead to long-lasting dysfunctions and even structural changes that may become a reason for the emergence of addiction in puberty and maturation, especially if NLEs are persisting [15]. On the other hand, as can be seen from our previous results and other authors research, NLEs in different periods of life tend to interact, numerous early events predicting more events in the older age [6, 16]. In many studies it was established, that such events can sensitize the organism to further life stress and enhance self-administration of alcohol and drugs, which eventually may lead to addiction [5, 6, 16].

In view of this we have concentrated on the quality of early negative life events that may delineate a culturally-sensitive profile of the child maltreatment. Our analysis has shown that a wide number of stressful and traumatizing events are associated with the future development of addictive behavior. When prioritizing is based on the comparison of addicts with non-addicts, the drug or alcohol problem in the family and being brought up by persons other than parents appear to be first on the list. Also emotional and psychological tortures rather than physical and sexual assault (which are most often mentioned in other studies) are represented among NLEs in addicts. The strongest associations were found between reporting of being emotionally and psychologically tortured by father and mother, followed by being brought up by persons other than parents, and father’s addiction. Lower associations were found between thinking that parents do not love, do not want to take care, even hating one of the parents. Next to it
is a serious physical attack or assault (not by the family member). These data may be interpreted in terms of cultural differences of reactivity of children to stressful situations [17]. Our respondents as mature personalities may be projecting their feelings at their childhood while their current responses may be influenced by their memorized childhood emotional reactions and grievances, which are culturally sensitive and in our cohort seem to be driven by dysfunctional relations with parents and negative emotions stemming from these relations.

In general our results confirm the role of early psychological and emotional traumatization but not of physical assault, so far as addictive respondents seem to have experienced mostly emotional and psychological negative influences from their parents. It is characteristic that physical attacks by parents were not in the priority, such kind of events were outside the family. As for the sexual violence, this kind of NLE was not in the priorities and, though appeared among other significant associations, with the lowest statistical power. On the other hand, the influence of such events should not be underestimated, though being very rare, they may have a profound negative impact with the most severe consequences to mental health [18].

Obtained results give an impression of the quantity and, most important, the quality of early life adversities and psychological problems, that may lead to addictive behavior in the future, and once more draw attention to the importance of family integrity and positive family relations as factors that may help to avoid addictive behavior in offspring. It also supports the direction of psychological counselling and measures of rehabilitation, which must include efforts to overcome emotional gaps between addicts and their family environment and efforts to achieve reconciliation between family members. This idea is very much relevant for the “12 steps” rehabilitation strategy, which includes family sessions as well, the analysis of co-dependence, and measures of re-establishing relations with family members.

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Limitations of the study

Results of study are fully based on the retrospective reporting of the events that have happened a certain time ago, thus it may be a subject of projection of the actual feelings and emotions of respondents onto their childhood. This limitation is adherent to an overwhelming majority of studies on early life stress, thus comparisons remain appropriate. Another limitation is the difference of the mean age of the studied groups, which may influence NLEs accumulation, but mostly in the period 19 years and over, while NLEs in the earliest life period are unlikely to be influenced. Thus, the results regarding NLEs counts after 19 must be taken with caution.
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Sažetak

U ovom je istraživanju 117 ovisnika o drogama i alkoholu (97 muškaraca i 20 žena) uspoređeno sa skupinom zdravih ispitanika. Svi ispitanici ispitivani su o negativnim životnim događajima (engl. Negative Life Events – NLEs) koji su im se dogodili u različitim razdobljima života, posebno u dobi od 0 do 6, 7 do 14, 15 do 18 te 19 i više godina. Upitnik se sastojao od 69 pitanja koja su se odnosila na događaje kao što su „napad”, „razvod/razdvajanje”, „veliki financijski problemi”, „teške bolesti ili ozljede”, „pravni problemi”, „gubitak osobe od povjerenja”, „ozbiljni bračni problemi”, „pljačka”, „ozbiljne poteškoće na poslu”, „ozbiljni stambeni problemi”, „gubitak posla” itd. Događaji koji obuhvaćaju mrežu bliskih ljudi u ranom životnom razdoblju uključuju smrt roditelja, gubitak bliske osobe, ovisnost roditelja o alkoholu i o drogama, probleme u odnosima s roditeljima, odvojenost od roditelja, odgajanje od strane drugih osoba, stambene probleme, vrlo loše odnose s roditeljem itd. Utvrđeno je da je broj negativnih životnih događaja kod ovisnika tri puta veći nego kod skupine zdravih ispitanika – razlike su bile statistički značajne (p < 0,001) u svim životnim razdobljima. U hijerarhijskom regresijskom modelu koji je primijenjen negativni životni događaji u ranom djetinjstvu i ranoj odrasloj dobi (nakon 19 godina) imaju veći utjecaj od negativnih događaja u školskoj dobi i adolescenciji. Analiza negativnih životnih događaja u najranijoj životnoj dobi (do šest godina) kod ovisnika je pokazala da su problemi roditelja s alkoholom i osjećaj da ih roditelji ne vole, pa čak i emocionalno muče bili mnogo češći nego kod skupine zdravih ispitanika. Druge jake asocijacije uočene su kod odgoja od strane drugih osoba. Tjelesno i seksualno nasilje nisu bili među prioritetima i nisu bili tako snažno povezani s ovisnošću. O rezultatima se raspravlja u smislu mogućih kulturoloških karakteristika koje mogu utjecati na određivanje prioriteta kod dječjih negativnih događaja i njihovu važnost za daljnji razvoj ovisničkog ponašanja. Dobiveni rezultati mogu biti korisni za izradu rehabilitacijskih mjera za ovisnike, posebno tijekom obiteljske terapije.

Ključne riječi: ovisnost o alkoholu i drogama, životni stres, negativni životni događaji, životne neprilike u ranoj životnoj dobi, psihološka trauma, odnos roditelja i djeteta