

Ecological Consciousness of a Personality Living in an Ecologically Unfavorable Region

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This article covers on the matters which allow stating that people living in the areas with unfavorable ecological conditions experience long-term psycho-traumatic psychological stress caused by exaggeration of irradiation danger and its aftereffects for health. The reasons for long-term psychological stress as per the results of questionnaire and experimental research are the fact of existence of long-term radiation risk for public health, insufficiency of finance, information factor, low level of public knowledge on radiation and related biological, medical and other effects. The analysis of the data has shown that under the influence of unfavorable ecological factors the structure of personality is changing, causing the following personal characteristics to emerge: anxiety, aggression, and rigidity, which, in turn, undermine the vital adaptation of a human's activity. The adverse factors act on people not instantaneously but within a long period. The psychological aftereffects upon testing nuclear weapons create a particular typical model of personality. In persons of a basic group, living in radioecological stress condition, psychological defense activities were broken, causing despair, depression and confusion. Also, interpersonal relations systems were broken causing the sphere of life interests to narrow down, and adaptive and accommodational abilities to decrease.

Keywords: ecological factor, social and psychological stress, nuclear tests, ecological consciousness.

INTRODUCTION

In the contemporary world, unfavorable ecological situation has become a continuously acting factor of human life activities which brings a threat to the human present and future [1, p. 150]. In our world, there are a lot of regions where natural and climatic conditions and commercial profile cause ecological problems of various level. Long-term existence in unfavorable – or even crisis – regions from the ecological standpoint is related to the risk of emerging changes in human psycho [2, p. 446].

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The study of negative and adverse effects of ecological problems on human organism further causing socio-psychological stress in personalities is one of the urgent scientific tasks which requires to combine for its solution the efforts of various specialists – ecologists, health professionals, psychologists, pedagogues and anyone concerned in sound existence and life activities of people.

National and foreign psychologists have accumulated a great deal of theoretical and empirical materials on the role of environmental determinants in the mental development. Most fully, the effect on human mental development of the social environment factors (learning, training, socio-economic situation of family, cultural specifics, etc.) has been studied. Meantime, natural, physical and anthropogenic environment is also able to affect the formation of psycho. The physical environment is one of the environmental components along with other: natural environment, social environment.

Theoretical analysis

Physical environment, as per N.M. Sarayeva and A.A.Sukhanov, means ‘aggregate of physical and chemical characteristics of the ambient environment (radiation background, level of air/water pollution, lighting level and other factors of non-psychological nature)’ [3]. Interaction between physical, natural and social environments has its specific features in each particular region. Acceptance of multifaceted determination of psychic sphere provides for the need for a deeper study of the influences on psychological special features of people, natural conditions, and physical environment as a component of the inhabitable environment and for knowledge of its regional specifics. First, the point is the effect of the physical environment on psycho, as unfavorable physical environment is a risk factor for mental development of a human.

Deformation of the environment, as per V.I. Panov, S.D. Deryabo, V.A. Yasvin and others, inevitably brings forth the changes on all the levels of human organization, biological, psychic, personal, and the most prospective here is considered the strategy of system analysis of integral psychic formations in the context of interaction with the environment. Meantime, it should be noted that the effect of climatic and ecological environment on the formation of psychological specifics of people has been studied rather weakly so far [4-5]. The aftereffects of its influence are greatly extrapolated based on the specifics of psychosomatic disorders caused by them, as opined by Ye.N. Dzyatkovskaya [6]. In the study of unfavorable factors of the environment on the human psychology a lot of attention is paid to the issue which aspects and parameters of the psychic activity are more often and to a greater extent exposed to changes.

The changes in the psychic activity under the influence of unfavorable ecological environment are occurring sporadically under certain dependencies, and those changes are not a simple sum of deformations of some functions and abilities, but a new state with particular inherent structure. Most authors studying the structure of changing psychic activity depending on the influence of unfavorable eco-factors point to the domination of psychosomatic disorders [7].

In compliance with the ecological approach created in the works by Russian scientist V.I. Panov, psychological aspects of ‘Human – Environment/Nature’ system act as the object of ecological psychology. As per V.I. Panov, in specific and methodological view, various directions of eco-psychological research differ by the subject of research. As to specification of system relation ‘Human – Environment/Nature’, different understandings are used in connection with a notion of Human (an individual, a group, an ethnos, mankind), Nature (object of studies by natural sciences, environmental habitability conditions, all-existent universum) and different types of Environment and therefore types of interaction between the components of this system [8].

In particular, typology of individual – environment relations may differ in the following parameters:

- in subject content of environmental factor (spatial, family, educational, informational, ethnic, sociocultural, spiritual, etc. types of environment);
- in a type of mental reality regarding which interaction with environment is considered (mental process, mental condition, consciousness);
- in a type of psychic sphere affected by the studied influence of the environmental factor (body-related implying somatopsychic, emotional, intellectual, personal, spiritual and moral);
- in a degree of influence, in particular, extreme situations causing critical mental conditions resulting in acute injuries and post-traumatic psychological aftereffects;
- in a level of arbitrariness of an individual's regulation of his/her condition and behavior;
- in functional sense of Environment as a component of relation Individual-Environment. Here, it may mean that environment may act as a fact, a factor, a condition (opportunity) and means of development of mental reality in Individual-Environment system as well as an object of design, modeling and expertise;
- in a type of interaction between components in Individual-Environment system:
 1. Object – object (psychological ecology);
 2. Subject – object (psychology of environment, psychology of anthropocentric type ecological consciousness);
 3. Subject – subject (psychology of ecocentric type ecological consciousness);
 4. Subject – creating, i.e., creating joint activity subject and/or development of system 'Human – Environment/Nature'.

In his work, V.I. Panov specifies one of the kinds of situational interaction in the system 'Human – Environment/Nature', namely 'object – object' interaction, where the change of mental condition occurs via chemical and physical impact on individual's physiological structures thereby causing somatopsychic sphere to change.

Issues of changing mental conditions in extreme situations are considered as a result of environmental factors.

View of scholars

As per N.D. Levitov, mental condition is an intermediary mental formation between a psychic process and personal characteristics as such. Mental condition, stably reproducing not only the method of perception but also the nature of behavior (action), in certain situations being, in essence, an image – as a product of mental reflection and a means of exercising various activities in various conditions [9].

In works by N.M. Sarayeva, N.M. Dyachkova, T.I. Yezhevskaya and A.A. Sukhanov on the research of children's cognitive sphere in unfavorable ecological conditions as exemplified by Chita Oblast of the Russian Federation the decrease of cognition processes was detected, caused by the ecological factors as well as socio-economic situation, low level of culture and education, family institution crisis [10].

V.I. Yekimova in her research stressed that in the areas with high radionuclide pollution the ecological factor, interacting with other unfavorable conditions of the general situation for children, becomes an extra factor for the risk of emerging mental disorders of various degree. In the course of cluster analysis of mental condition in fifth graders in two groups from ecologically unfavorable and conventionally clean areas the author observed that in the dirty area asthenization was found in almost all pupils while astheno-neurotic symptoms (emotional lability combined with changing

functional condition) were found in 64% children. Meantime, in the control class only 15% schoolchildren got into the risk group under that criterion, while 45% had stably high emotional and functional parameters [11].

Russian scholars N.V. Tarabrina, Ye.V. Petrukhin in their research of psychological aftereffects upon surviving the stress of radiation threat in liquidators of the Chernobyl nuclear power plant disaster acknowledge that those persons are suffering post-traumatic stress disorder and are subject to various forms of disadaptive behavior. Many negative states (irritancy, insomnia, etc.), unfavorable events in life (for instance, a divorce) are linked with Chernobyl [12].

A.V. Petrovskiy considers socio-psychological disadaptation as a process of violating homeostatic balance of a personality and environment; as inability of a personality to adapt to one's own needs and aspirations [13].

Despite a great number of research completed, the issue of the nature of worsening psychological characteristics in population permanently living in radiation polluted areas is still disputable. The observed neuropsychic disorders are considered borderline, mainly psychogenic and functional. They are interpreted, as opined by N.V. Tarabrina, Ye.O. Lazebnaya, M.E. Zelenova, as a post-traumatic state, in the emergence of which a psychic trauma is the primary factor [14]. The authors following this point stress the following psychological specific features – in the sphere of psychological processes: attention and motion-deficit disorders, disordered memory functions, incomplete assessment of situations; in the emotional sphere: increased anxiety level, irritancy, high affectability; in the personality sphere: feeling of isolation from common communities, decrease of creative elements of activity, egocentrism, indifference.

The authors G.M. Rumyantseva, M.O. Lebedeva who studied the persons living in the radioactive pollution area note the growing number of non-specific diseases including depression, increased anxiety, various psychosomatic disorders [94]. Discussing possible reasons for emerging disorders, many researchers share the opinion that in the conditions of long-lived ecological stress their formation begins to be affected by extra (socio-economic) factors [15]. Specifically the role of the informational factor is underlined in the literature. The population which was not told the truth about what has happened still does not trust officials, continuing to think that diseases are caused by radiation even today. It was found that the 'fear' indicator in a polluted area is 1.4 times higher than in a clean area. Death of any Chernobyl veteran regardless from any certain reason is linked solely with the radiation effect which indirectly confirms the worst concerns. Such view of radiation only increases distress causing the increased number of psychosomatic diseases [16].

Besides the distrust of the official information on the scale and aftereffects of the disaster, other important factors causing unfavorable psychic aftereffects in the population are considered as follows. Feeling uncertainty on the influence of radiation on health; adaptive difficulties due to difficult cognitive assessment of similar situations; state of hypervigilance caused by anxiety about somatic health; somatic neurosis caused by fixation on traumatic experience, as noted by B. Andersen [98].

Research of scholars

In his research, H. Miyata notes that most Japanese who survived bombing had long-term features of fear in connection with future negative radiation effects; people fear diseases and abnormalities in their children [17].

In the results of the work by V.P. Gritsenko on the study of socio-psychological stress in the population of radioactively polluted areas of the Ural region in the long-term, high level of anxiety in the East Urals radiation trace was detected as well as in

the inhabitants of the bankside communities on the Techa river. The author showed the commonality of pathopsychological features in the inhabitants of the Techa river and the East Urals radiation trace and their statistically reliable difference with the control group. In the population of radioactively polluted areas, general disadaptation and distress were developing. For overwhelming majority of persons living in radioactively polluted areas the fact of radiation disaster was a 'specially significant' or 'significant' event in their lives which indirectly acknowledges that the main psychologically traumatic situation is psychoemotional stress caused by exaggeration of irradiation and its aftereffects [18].

In studies by V.A. Buykov, V.V. Kolmogorova, E.Yu. Burtova of irradiated diseased people after the southern Urals radiation disasters it was found that in that kind of community neurotic features were prevailing, connected to stress and somatomorphic disorders. Meantime, the diseased people often complained of somatics. They complained of headaches, defective memory, worsening memory, and attention deficit disorders. That category of the diseased people was much inclined towards rent expectations although the wish to quit working was not obvious [19].

In works by I.A. Zykhova, G.V. Arkhangel'skaya the problem of public informing of radiation was studied. In their opinion, first, it means high urgency of information for some regions, i.e., special and specific interestedness of population in it in the areas of real or potential radioactive threats. Second, it is the distrust of any, including unbiased and scientifically rationalized information about radiation [20].

As noted by I.V. Davydovskiy and A.V. Snezhnevskiy, 'social factors do not act on a man directly but always in some or other way, sometimes refracted in natural factors and biological basis of a human'. 'Social' in a human is indirectly mediated via higher nervous activity exercising the regulation function of the processes inside organism and its interaction with the external environment. Life and environment in general are addressing the nervous system and psychic activity as a whole as well. But the integrity of interaction is almost never static, unchanged, undifferentiated. Depending on selective action of the environmental factor on some or other type of typological parameter, psychic phenomena possessing other qualitative distinctiveness will be emerging [21].

Individual significance of the environment factor is expressed in electivity of interaction between external factors and the most vulnerable parameters of the typological structure of a personality. Specification and differentiation of external factors requires the same kind of analysis as the psychophysiological structure of personality itself. Meantime, expressed pathocharacterological specifics correlate with both the degree and level of natural representativeness and electivity of the environmental factors, their force and nature. Meantime it should be noted that the concentration of force and significance of the environmental factors is also possible which will be deforming physiological parameters of higher nervous activity type identifying its 'pathophysiological' shift.

Thus, in the population long living in ecologically unfavorable areas under the influence of biased perception of information about those unfavorable factors, certain psychological specific features are developed.

Semipalatinsk nuclear test site

Nuclear weapons test at Semipalatinsk nuclear test site proved dangerous for the areas and population of Kazakhstan and the Russian Federation.

The most polluted with fission products were Semipalatinsk, East Kazakhstan, Pavlodar Oblasts of Kazakhstan and Altai Krai of the Russian Federation.

As per the data of academician S.M. Balmukhanov, the number of irradiated people was about 3 million persons including 1.5 million persons in the Russian Federation and 1.5 million in Kazakhstan [22].

By demand of the President of Kazakhstan Republic N.A. Nazarbayev the military authorities (Polygon and Minatom) in 1992 submitted the report on irradiation doses received by people of 711 communities in Kazakhstan as per unclassified data on the characteristics of land and air explosions [23].

As per the data of sociologist M.A. Abishev, currently the number of persons directly irradiated in 1949-1965 is 30-35% of the total population of Semipalatinsk Oblast. The second generation of people born by irradiated parents in 1965-1980 is 40-45% of the population of a region. Finally, the third generation born after 1980 is 20-30% of the total population [24].

A Russian biologist O.I. Vasilenko did medical and biological research at Semipalatinsk nuclear test site. In his work the author noted that in radioactive pollution areas irradiation of people was of combined nature – joint external and internal irradiation. Radionuclides could be inhaled by people at the moment of leaving the atomic cloud or taken orally with polluted food products and water. Combination of external and internal irradiation caused comprehensive development of pathological processes [25].

V.K. Sakharov described the nuclear tests at former Semipalatinsk nuclear test site and specified the areas which suffered from nuclear tests as well as the doses received by the population suffered.

At Semipalatinsk nuclear test site since 1949 to 1965 some 456 tests were made including 118 atmospheric tests, out of which: 25 – nuclear land explosions, 5 – prepared but not finished nuclear land explosions; 88 – nuclear air explosions [26].

Out of the total number of nuclear tests in the USSR's test sites, 6.6% account for Semipalatinsk site, 92.4% - for Novaya Zemlya test site, other – Kapustin Yar, Totsk test sites.

Specialists of the Research Institute of Radiation Medicine and Ecology of Semipalatinsk city calculated the parameters of radiation and hygienic situation and effective doses of people's irradiation for most of the famous nuclear explosions [27].

As a result of the calculations made and depending on the remoteness of a community from the epicenter of the nuclear explosion, 3 dose groups were specified in compliance with the decrease of public dosage. The first dose group is people irradiated with 250 to 500 mSv and more; the second – 50-249 mSv and the third – under 50 mSv. It was found that the population of 30 communities of Abaisk, Abralinsk, Beskaragaik, Zhanasemeisk administrative districts was irradiated with 750 mSv and more. The first dose group was also formed by the population of the above districts; the second – by Borodulihinsk, Novoshulbinsk, Charsk, Zharminsk districts population; the third – by Kokpektinsk, Aksuatsk, Makanchinsk, Urdzharsk and Taskeskensk districts population.

In the course of clinical and epidemiological research on the study of medical and demographic aftereffects, the first dose population was classified as the group of maximal realization of postradiation effects; the second – as increased realization of postradiation effects; the third – as minimal.

The respondents were residents of Abaisk, Abralinsk, Zhanasemeisk, Beskaragaik districts of former Semipalatinsk Oblast which suffered from the nuclear tests. Simultaneously, to compare the results of research, a representative and adequate by all modifying parameters control group was used comprising Kokpektinsk district of former Semipalatinsk Oblast which virtually was not affected by radioactive fallout [28].

METHODOLOGY

We used the medical inspections data, questionnaires, 'Self-assessment of depression' guideline, data from situative and personal test anxiety inventory by C.D. Spielberg, somatic diseases and questionnaire data [29].

Primary medical history allows monitoring somatic diseases of the respondents from experimental and control groups to assess objective and subjective parameters of self-assessment of a respondent's health. Meantime, the subjective factor for assessment was identified by two ways:

1. Individual interview with a respondent during medical inspection,
2. Questionnaire data.

This kind of comparative analysis allows identifying 'subjectively correct' and 'subjectively incorrect' self-assessments of physical and psychological health by respondents of experimental and control groups which, in turn, allows to indirectly identify the impact of the informational factor on subjective self-assessments of respondents' psychophysiological state.

The analysis of documents included medical history, poll, individual interviews, and inspection records of people living at former Semipalatinsk test site. Inspection records contained the basic socio-demographic features like surname, name, patronymic, age, gender, nationality, place of residence, radiation route (area of residence, 'legally confirmed' in radiation-affected regions), individual effective dose, education, occupation, family status, alcohol consumption, somatic pathology, disability category, somatic complaints. A questionnaire was made to study which way the aftereffects of former Semipalatinsk test site influenced public health and condition.

Thus, before the commencement of the psychological research all respondents of experimental and control groups passed medical inspection in the National Research Center of Radiation Medicine and Ecology in Semey city.

The first place was occupied by endocrine system diseases, in Abaisk district – 85%, in Abralinsk district – 75%, in Beskaragaisk district – 80%, in Zhanasemeisk district – 80%. In control group, in Kokpetinsk district there were 55% respondents. The second place was occupied by cardiovascular diseases: in experimental groups (48%, 44%, 44% and 48% respectively). In control group, 28% respondents had cardiovascular diseases (28%). The third place was occupied by diseases of central nervous system (CNS): in experimental group of Abaisk district – 28%, Abralinsk district population – 36%, Beskaragaisk district respondents – 30%, in Zhanasemeisk district – 46%. In control group of respondents, 16% had diseases of central nervous system. Also, other diseases of somatic system were observed (urogenital, gastrointestinal, respiratory, skin diseases) but to a lesser degree.

Those diseases are registered in medical histories of each of the respondents. The specifics of somatic diseases flow in respondents were insufficient clinical manifestation, mosaic clinical presentation. A typical characteristic was massiveness and multisystemic damage of organs and systems [30].

In individual interviews with respondents, most of them considered that the dose received by them was a few times higher than recorded in the official documents. That break was perceived by them as an extra source of internal conflict which, in turn, acknowledged the discrepancies between the objective data and subjective self-assessment of respondents' conditions. Such phenomenon was described in connection with the aftereffects on liquidators of Chernobyl nuclear power plant disaster (G.M. Rumyantseva, O.V. Chinkina, T.M. Levina, 2002).

RESULTS

Anxiety causing vulnerability to external unfavorable effects was observed in the population of ecologically unfavorable areas affected by the environmental factors. Experimental groups of respondents felt internal tiredness, stress, suffering unreasoned inferiority feeling, depressed mood and dissatisfaction. High level of anxiety is a type of compensating behavior as a preferable way to personally protect people. The experimental group of respondents living in ecologically 'dirty' areas is

united by common psychological characteristics: high anxiety related to individual specifics of radiation risk perception, specific mechanisms of psychological defense, somatic pathologies. The respondents from experimental groups had their individual radiation dose registered which was an extra source for high anxiety, long-lasting effect and high significance for health. The respondents living in the area of former Semipalatinsk nuclear test site experiencing high anxiety had the hierarchic nature of values system disordered, i.e., the latter were divided into primary and secondary. Those respondents were characterized by the highest narrowing of the value field. The respondents expressed ideas of their inferiority and worthlessness. Most of them felt anxiety and dominating moral assessment of their conditions in connection with the inability to fulfill their duties characterized via experiencing moral loss, deprivation and fear as they were living in radioactively polluted areas [31]. That fact also evidences greater influence of information about radiation as, according to unbiased data, in the area of the communities located in former Semipalatinsk nuclear test site the level of radiation does not exceed 1 Sv. In some portion of experimental groups, anxiety was observed in connection with life difficulties and everyday practice tasks. In control group, such trend was little manifested. This is acknowledged by V.Ye. Kagan's data who stressed that, having no opportunity to change the environment in which it is hard to live, understanding of incompetence urges a subject to employ protective behavior forms, to create sense and emotional barriers in relationships with others [32].

High level of personal anxiety in experimental groups evidences that for people, for a long time living in former radiation-polluted areas, this fact is in essence a chronic psycho-traumatic situation. That phenomenon was described in scientific studies on socio-psychological stress in the population of radioactively polluted areas of the Urals in the remote period.

In all experimental groups, high personal anxiety was observed which evidences neurotic conflicts, emotional and neurotic breakdowns.

A trace for fixation of anxiety state of the tested experimental groups was the complex of somatic diseases. A trend was observed in connection with linking somatic diseases of experimental groups with possible radiation effect.

DISCUSSION

Living in the area of former Semipalatinsk nuclear test site and expecting rather negative aftereffects of nuclear weapons tests as well as perceived threat to health due to irradiation possibly made people more attentively listen to their physical sensations which could prove the first traces of a disease related to radiation. Thus, many public health problems experienced in the area of former Semipalatinsk nuclear test site are a result of not only radiation but psychosocial factors.

Thus, psychological aftereffects upon testing the nuclear weapons at former Semipalatinsk site form a certain typical model of personality. It is characterized by long-term distress manifested via somatic complaints. That model is becoming chronic. In experimental groups, respondents had their psychological protection mechanisms broken causing states of despair, depression, confusion. They had their interpersonal relations systems broken, life interests sphere narrowed down, adaptive and accommodational abilities decreased.

The research allows concluding that people living in the areas of former Semipalatinsk nuclear test site have been experiencing long-term psycho-traumatic psychological stress caused by exaggeration of the radiation and its aftereffects influence on health. The reasons for long-term psychological stress, as per questionnaire results and experimental research are the fact of existence of long-term radiation risk for public health, insufficiency of finance, information factor, low level

of public knowledge on radiation and related biological, medical and other effects [33].

CONCLUSION

The research allows saying that people living in the areas of former Semipalatinsk nuclear test site have certain features and characteristics; mainly low-income rural population expressing dissatisfaction and anxiety in a biased way links personal health with radiation influence bringing some requirements in connection with preferences and compensations. To decrease the socio-psychological anxiety, special activities should be carried out in connection with socio-psychological rehabilitation of people.

The study and analysis of the indirect influence of the radiation factor on the public mental activity were done by psychologists in Russia, Belorussia, Ukraine and a part of Europe which suffered after the Chernobyl nuclear power plant disaster. Similar studies in Kazakhstan were done in smaller volume. So far there have been no characteristics of psychological specifics of adults living in the areas of Semipalatinsk nuclear test site.

Therefore, the results of the study of this problem in radiation risk group respondents taking into account the radiation situation after the nuclear weapons tests at Semipalatinsk test site will help introducing the methods to diagnose the psychological specifics and rehabilitation of the people suffered.

To decrease the high level of personal anxiety, psycho-emotional stress and depression in population living in the areas of former Semipalatinsk nuclear test site, it is required to take certain measures in connection with socio-psychological rehabilitation of people.

It is offered to create a special service for socio-psychological assistance to the people living in radioactively polluted areas.

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