Psycho-immunological Aspects of Life Support System Functioning exemplified by Russian Winter Swimmers

Maria V. Bogdanova - Tyumen State University,
Tatyana A. Fisher - Tyumen Scientific Centre of Siberian Branch of the Russian Academy of Sciences

1. Introduction

The life support system (hereinafter referred to as LSS) is a multi-level system of protective-adaptive mechanisms which allows a person to effectively cope with difficult life situations, stress and frustrations, while maintaining the integrity of self and mental health. It can be said that the LSS has some similarities with the concepts of resistance and resilience in its protective-adaptive functions, but it differs significantly in structure and development. The structure of the LSS has 4 main levels, and each level is divided into sub-levels: 1) the level of psychosomatic response (immune sub-level of protective response; psycho-physiological sub-level; sub-level of psychosomatic disorders); 2) the level of psychological defenses (sub-level of immature defenses; sub-level of mature defenses), 3) the level of copings (sub-level of instrumental coping strategies; sub-level of targeted coping strategies); 4) the level of higher personal resources (sub-level of integrating processes, which includes a dynamic self-regulation and personal growth; sub-level of integral characteristics (personal traits), which provide vitality, resilience, adaptability, personality maturity).

This study focuses on the level of psychosomatic response in LSS. Recently, the key role in the self-regulation of the organism is increasingly assigned to the psyche and the immune system (Lopes, 2017). At first glance on the one hand the psyche and the immune system have little in common with each other since they are rather isolated (autonomous) in relation to each other. But on the other hand a number of similar features are found behind which there are deep evolutionary strategies and patterns.

Hypotheses:

- 1) the influence of cold procedures leads to a change in the functioning of the LSS: anxiety decreases, the level of cognitive need increases;
- 2) the functional activity of the immune system changes at the level of the psycho-physiological response.

2. Materials and Methods

Group 1 (G1) is a control group - people who are not engaged in winter swimming.

Group 2 (G2) is an experimental group - people engaged in winter swimming from 5 to 12 years.

Both groups were subjected to a single cold procedure.

Psychodiagnostic methods were used: Luscher test, Anxiety test (STAI), "Cognitive need" of V. S. Yurkevich, "Lifestyle index" of Kellerman-Pluchek.

Immune parameters of repertory lymphokine interleukin - 4 (IL-4) (marker of humoral immunity) and INF- γ (marker of cellular immunity).

3. Results

Fig. 1. Motivation for success.
G1 - control group; G2 - experimental group.

Fig. 2. Cognitive need
G1 - control group; G2 - experimental group.

Fig. 3. State-Trait Anxiety Inventory Results.

4. Discussion

Summing up the results of testing we assume that the high need for knowledge and the high motivation for success of winter swimmers are related to their curiosity, they belong to the research dopamine type and they are interested in vivid experiences. Prolonged exposure to cold stimulates cognitive activity through physiological mechanisms, in particular, the immune system.

G 2 have a high percentage of communicative motives, and suggested that it became reason for including to the winter swimming club as a defense against loneliness, searching for friends, etc.

Fig. 4. Anxiety Index for Luscher Test.

unctional activity factor of the humoral immune system (IL-4).

Perhaps, the desire for knowledge acts as one of the distraction type copings - going into the intellectual sphere.

Perchance, a high trait anxiety in winter swimmers is an unconscious factor and the main reason why people came to the winter swimming club. The cause of trait anxiety may be an inadequate assessment of oneself, and this indicator may also indicate the presence of an intrapersonal conflict.

G2 are under stress. High situational and trait anxiety (according to Spielberger) encourages the activation of protective and adaptive mechanisms. Winter swimmers use the corporeal level of LSS . By acting on the body they reduce anxiety.

Maybe winter swimming is a specific coping, it does not help to solve current problems. This way is aimed at coping with emotions through bodily influence, experiencing even stronger emotions. The purpose of our future research is to test the assumption of the destructive effect of winter swimming.

5. Conclusions

Winter swimming can be considered as a specific type of distraction coping. High anxiety before swimming and its removal after swimming indicates that winter swimmers actively engage the corporeal level of LSS.

Winter swimming as a lifestyle includes protective-adaptive mechanisms of at least three levels of LSS: corporeal level (release of endorphins, i.e. feelings of "cleansing and release" that winter swimmers talk about), copings (winter swimming as a distraction coping) and the level of higher personal resources (belonging to the club of special people, willingness to meet the challenge and overcome difficulties).

People use winter swimming to improve their psychological state, but at the same time they have a developed dependence on cold stress at the level of psychosomatic response (Immune sublevel of protective response). In this case, it can be assumed that the "exploitation" of the immune system is taking place. This situation in turn can lead to the development of dysfunctions in the immune system and the emergence of somatic diseases with atypical manifestations.