Original Article

Influence of self – regulation psychological and physical means on aged people´s functional state

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ABSTRACT

Purpose: to form system of application of self-regulation psycho-physical means on mature and aged people. Material: experimental (n=28) and control (n=26) groups consisted of 55-60 years' age man, who did not practice sports beforehand and who had low mobile way of life. All man had no pathology in their health. All they gave written consent for participation in the research. The complex of special exercises was practiced every day during 20 – 30 minutes. We regularly registered indicators of heart beats rate during autogenous trainings in first, second and third weeks of psycho-physical means' application: autogenous trainings and exercises of special gymnastic. Results: we worked out a variant of autogenous training, which implies visualization of some objects. Such approach facilitates relaxation and creation of rejuvenation and health improvement image. We also developed special gymnastic on the base of Taoist health related physical exercises. Autogenous training, in combination with special exercises qigong cause changes, required for economic functioning of organism. Autogenous training greatly influence on heart beats rate. Change of this indicators is especially noticeable in first week of autogenous training's practicing. Combination of special qigong exercises and autogenous training renders positive influence on vegetative balance and orthostatic stability of elderly people. We worked out the structure of psycho-physical means for rising mature and older people's functional state. Conclusions: the offered system slows down the temps of ageing and activates adaptation mechanisms. It permits to compensate negative changes in organism. We marked out three

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directions in physical culture of mature and aged people. **Key words:** AGE, PSYCHO-PSYCHICAL MEANS, AUTOGENOUS TRAINING, HEALTH.

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INTRODUCTION

Nearly every man , in his life, strives to achieve own targets, overcomes a number of different obstacles. The time of success is coming; children gradually become independent, life becomes stable and confidence in the life appears. But new obstacle appears suddenly. It is much more difficult to be overcome. It is old age. It can not be defeated. It can only be postponed until a person has wish to be young and spiritual forces to fight with this invisible enemy. When old age starts? There is no single answer to this question. Some scientists think that ageing starts since very birth, but to certain time it is called "growing up" (Allison et al., 2016). Other authors think that ageing starts since 27 years' age, when main organism's systems become mature (Oleshko and Korobeynikov, 2006). The third have opinion that ageing starts at 39 years' age, when degradation of neurons' mielin sheaths starts (Carol, 2004). In any case prevention of ageing shall be relevant long before it brings its ruining effect (Kligler and Lee, 2004).

Biologists are sure that ageing can be significantly postponed (Baevskij, 1989; Korobeynikov and Fed'ko, 2003). Organism's ageing starts already, when tissues and organs continue normal functioning. However, with age organism's resistance to negative environmental factors reduces and some organism's systems stop normal functioning.

At present time, for prevention from too early ageing there is a lot of practical directions of activity, connected with medical and social servicing, introduction of many food adds and etc. But the main role belongs to physical exercises (Prushva, 2015; Furman and Salnikova, 2015; Kuzmin et al., 2015; Fedyniak and Mytskan, 2016).

For aged people direct benefits from physical exercises include excitation and improvement of appetite, increase of glucose level regulation in blood, reduction of obesity, improvement of lipid profile; absence of constipation. Functional benefits include: increase of cardio-vascular endurance, strength, flexibility, balance, coordination and bone strength. In the whole, life span increases under influence of physical exercises (Zurita-Ortega et al., 2009; Shephard, 2014; Kozina and Iermakov, 2015; Kourilova et al., 2015).

Physical exercises' influence on women's general ageing and welfare is also an important problem. Physical ageing is an important factor of further life quality. More profound understanding of methods of women's ageing minimization is an important initiative for societies and great cultures throughout the world (Ekler et al., 2013; Briskin and Odinets, 2015; Hollis-Sawyer and Dykema-Engblade, 2016; Kozina et al., 2016).

In this case correct and careful teaching of advantages and safety of recommended physical functioning can replace false ideas and fears of elderly people about risks, connected with physical exercises. It can rise their motivation for regular physical functioning (Bertoldo Benedetti et al., 2011; D'Amico et al., 2015; Pop, 2016; Pryshva, 2016).

There exists a lot of theory and methodic on this problem. At present stage systemizing of existing directions and specifying of separate methodic are especially relevant.

The basis of our work and selection of psycho-physical means for improvement of mature and aged people's functional state is theoretical principles of vitaukt's and ageing psycho-physiological principles. The most completely ageing psycho-physiological mechanisms are regarded in works of V. Korobeynikov (Korobeinikov and Kharkovliuk, 2000; Korobeynikov, 2002). The author points that ageing is a determined process.

At the same time, in the process of ageing a number of adaptation changes in organism appear, which are directed at prevention from ageing ruining effects and its stabilization. On this conception adaptation theory of ageing is based (Frolkis, 1984). According to adaptation theory of ageing (the founder of which was V.V. Frolkis) ageing temp depends on organism's properties, which are genetically programmed. Ageing is a ruining process, which progresses owing to increasing with age organism's damages, caused by internal and external factors (Frolkis, 1984). Ageing is accompanied with a number of physiological and molecular changes in organism. Regular physical functioning remains to be the most effective mean of maintaining and improvement of vascular health (Gliemann et al., 2016; Ilnytska et al., 2016; Kozina et al., 2016).

Such definition of ageing complies with principle of ageing balance theory (Korobeynikov and Fed'ko, 2003). According to this principle ageing temps of different organism's systems are balanced at certain level. This level is in direct proportion with organism systems' contribution in maintaining of resilience and reproductive potential and inversely proportional to energetic and informational cost of their stable work. In this aspect it is purposeful to regard systemic mechanisms of bio-system's development as balanced process (Vojtenko and Pisaruk, 1992). In other researches the role of tolerance to physical load in health and life span of long-livers is shown. The authors note progressing reduction of lungs' functions, maximal oxygen consumption; maximal strength as examples of multi-factors' character of physical function's weakening with ageing (Venturelli et al., 2012).

Some other data witness about presence of factors, which influence on moderate energy losses of long livers among male population: professional functioning; geographic characteristics of area as well as way of life and genetic factors (Pes et al., 2013).

Alongside with ruining and degradation in the process of ageing in organism adaptation regulatory processes appear. In general such processes are directed at increase of organism's resilience. Such phenomenon is called vitaukt by V.V. Frolkis (vita -life, auctum – to increase). Vitaukt manifests in two ways: genetic and phenotypic mechanisms of vitaukt (Frolkis, 1984). Concept of "successful ageing" is also rather important. Absence of clear characteristics for construction of successful ageing conditions insignificant success in study of ageing. The authors found clear medical sanitary conditions, behavioral factors and biological mechanisms, which facilitate weakening of mobility and physical function of aged people. Besides, they offered promising measures for prevention from such after-effects. It is especially important in connection with growth of average life span in developed countries in context of maintaining of aged people's physical independence (Anton et al., 2015).

Thus, theoretical principles of ageing are reduced to the fact that there is vitaukt (increase of life span) phenomenon, directed at constant re-construction of organism's functioning. It facilitates strengthening of organism's adaptation potentials and resistance to ageing.

Among different approaches to reduction of ageing temps we can mark out several works. The authors recommend usage of traditional Thai exercises, which facilitate health preservation by means of physical culture and rising of life quality. Besides, it is recommended to use exercises in the frames of shamanism, Chinese medicine and Buddhism in addition to traditional western systems for soul and body healing (Sinnott, 2001). With it, it is noted that such approach renders rather restricted effect, like with usage of Tai Chi and Qigong exercises (Ngowsiri et al., 2014). It is noted that there is positive connection between some well-known traditional Chinese sport exercises and use for health of aged people or people with chronic diseases (Guo et al., 2016). In this aspect studies of long livers' way of life can be promising. The authors note that long livers' descendants have better functional status and lower risk of some pathology (Gueresi et al., 2013).

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Long livers have a unique set of personality's qualities, which partially can explain their life span. The life span is facilitated by positive attitude to life (Law et al., 2014). Assessment of successful ageing process permitted to find that prevention from obesity, improvement of sleep quality and propaganda of healthy life style can facilitate achievement of declining years (Wen et al., 2016). Importance of physical exercises for aged people should be added to it (Gajos et al., 2014; Bendikova and Bartik, 2015).

Metabolic syndrome, coronary heart disease, prostate cancer becomes wide spread. Besides there is youth's commitment to pro-western diets at the expense of traditional. Youth has fewer opportunities for physical exercises' practicing. It has been determined that assessment of individual testosterone can facilitate strengthening of men's health (Horie, 2011). Results of way of life studies permitted to determine the role of health indicators in earlier age in connection with emotional welfare and quality of further life (Han and Shibusawa, 2015; Arziutov et al., 2016; Ivashchenko et al., 2016; Podrigalo et al., 2016). Certain sense has study of biological mechanisms, which can explain differences between life spans of tall and short people (Samaras, 2014). Such approaches are substantiated and proved by researches on cell level (Carmona-Gutierrez et al., 2016).

Basing on the received by us earlier data we can formulate the following ***hypothesis:*** means of complex psycho-physical influence will render positive effect also on mature and older people.

Coming from analysis of literature and basing on results of our previous researches we formulated the following purpose of our present work.

The purpose of the work
To form system of application of self-regulation psycho-physical means on mature and aged people.

MATERIAL AND METHODS

Participants
Experimental (n=28) and control (n=26) groups consisted of 55-60 years' age man, who did not practice sports beforehand and who had low mobile way of life. All man had no pathology in their health. All they gave written consent for participation in the research.

Procedure
In the process of the researches we studied influence of special exercises' complex (in combination with autogenous training) on vegetative balance and orthostatic balance of mature and aged people. In experimental group we used autogenous training and qigong special exercises. When fulfilling exercises, the tested concentrated on exercises' effect, presented in their original description. Autogenous training was practiced with the help of specially trained instructor, every day. The complex of special exercises also was practiced every day, during 20-30 minutes. We measured heart beats rate during autogenous training in first, second and third weeks of trainings. Control group practiced standard complex of therapeutic physical culture exercises every day. This complex included movements of arms, legs in combination with breathing exercises. In control group autogenous training and conscious concentration on exercises' effect were not used. In experimental group we used special complex of psycho-physical exercises during 3 weeks. We measured indicators of variable pulse-metering with the help of monitor of continuous heart beats rate registration «Polar» and appropriate software.

We registered the following indicators of heart beats rate:

1. Mo (mode of RR-intervals' duration) – the most frequent interval between RR peaks (sec);
2. AMo (amplitude of mode of RR-intervals' duration) – percentage of the quantity of the most frequent intervals in relation to general quantity of the measured intervals (in our case we used 50 RR-intervals) (%);
3. D*x* – variation magnitude of RR-intervals' duration, i.e. difference between the highest and the lowest value of RR-intervals (sec.);
4. Index of regulatory mechanisms' (H) tension (conv.un.) was found by formula:

$$H = AMo/2Mo \bullet Dx$$

Where: D*x* – value of variation magnitude of RR-intervals' duration (sec.),

Mo - mode of RR-intervals' duration (sec.),

AMo – indicator of amplitude of mode of RR-intervals' duration (%).

In analysis of heart beats rate indicators we based on the fact that listed above heart beats rate indicators reflect different contribution of sympathetic and para-sympathetic sectors of vegetative nervous system in the process of cardio functioning regulation. Mo of RR-intervals' duration points at resulting effect of regulatory effects and reflects the most stable in this conditions functioning level. Variation magnitude reflects the range of possible deviations of signs (variant) of random process and is determined by expressiveness of heart beats rate breathing oscillations. That is why this indicator is considered to be indicator of autonomous control circuit's functioning. AMo of RR-intervals' duration permits to judge about activity of central control circuit. In this case increase of quantity of equal by duration cardio-cycles is a result of heart beats rate stabilization, reduction of values' spread (i.e. it points at weakening of auto-regulation effects). Thus, increase of AMo of RR-intervals' duration indicators and H witnesses about increase of tonus of vegetative nervous system's sympathetic sector. Increase of RR-intervals' duration variation magnitude witnesses about increase of vegetative system's para-sympathetic sector's influence. (Baevskij, 1989).

Characteristic of the worked out psycho-physical means for strengthening of mature and aged people's functioning state

In experimental group we used complexes of psycho-physical exercises, which required concentration on some images. These complexes included yoga, qigong, Tai Chi exercises and some other (Bian, 1989). These means are psycho-physical ones, as far as they imply integral impact on human physical and psychological aspects.

We worked out special gymnastic on the base of Taoist health related physical exercises' systems. In its base we put well known exercises of Taoist systems for prolongation of youthfulness and achievement of longevity (Bian, 1989). In such cases it is necessary to come from the fact that human organism and all phenomena in the nature have intrinsic to them genuine health self-restoration force (Mantak and William, 2012).

The worked out by us special gymnastic of psycho-physical exercises combines oriental and western health related physical exercises. The principles of this gymnastic were applied by us in complexes for people of other age and social groups (Inytska et. al., 2016). The first principle: movements shall be fulfilled by all body in main planes of human movements. They are the most rational and economic from the point of bio-mechanic and physiology of movement. In every movement all body parts participate in sequence, starting from finger tips, by principle of dynamic wave. The second principle – wave - like backbone movements

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prevail in the gymnastic, which improve blood circulation, influence on organism as a system; these movements are of kind of smooth muscles' movements. The third principle: gymnastic is built as a dance. In this dance one movement smoothly comes from previous that develops skill of economic and plastic motion. Such skill is necessary for harmonious natural movements. The forth principle implies mind visualization of different images, when fulfilling movements. The tasks of the complex are: removal of toxins from organism and its penetration with oxygen as well as improvement of blood circulation, maintaining of vital force; achievement of physical and psychological harmony, prolongation of life span.

Autogenous training is an integral component of system of physical exercises for mature and aged people. It can be practiced directly in the process of physical exercises (dynamic variant). With it, it is necessary to concentrate on organism's rejuvenation, its filling with energy, strength, increase of adaptation stability. Autogenous training can also be practiced independent on physical exercises (static variant) in comfortable, relaxed position. With it, it is possible to listen to individually suitable music with closed eyes. There are a lot of autogenous training variants. We offer the variant, which implies visualization of different images, which facilitate relaxation and creation of main image – rejuvenation and health improvement. It is important not only to imagine what you try but "to join" image, "to come" into it.

Below, we supply sample text of for autogenous training. Sit comfortably and relax. Let your thoughts follow the words. Imagine everything that touches your soul. You go along path. The path leads to the sea. Big trees surround you. They defend you, give you confident and strength. Their green leaves fill you with life and youthfulness. You feel as if every cell of your body is filled with oxygen, sun energy and warmth. Every step is the step to your childhood. With every step you are becoming younger. You feel wind and every its blow removes all negative: your diseases, wrong emotions, fears. With it, wind inserts freshness of perception, clear thinking, spiritual firmness, aspiration to aim and creative energy. With every step you approach to the sea. You step on warm, soft sand. You feel as if sand warmth penetrates your body and fills with happiness, love and rest. All these were gifted to you by your mother and all people, who loved you. You come to the sea and step in water. Water is the source of life. You gradually go deeper, start to swim and melt in this ocean of life, happiness and progressing. You are filled with wetness of life, creation and youthfulness. Every cell is filled with clean fresh sea air, life energy, strength, kindness and love. Sea brings you on the shore. You gradually return to your world and open eyes. Strength of trees, freshness of wind, life energy, gifted by the sea remains in you.

Such practice can be fulfilled as often as it is feasible for every trainee: from 1-2 times a day to constant mental setting for spiritual and physical health improvement.

Informed consent

Informed consent has been obtained from all individuals included in this study.

Ethical approval

The research related to human use has been complied with all the relevant national regulations, institutional policies and in accordance with the tenets of the Helsinki Declaration (WMA Declaration of Helsinki, 2016).

Statistical analysis

Division in control and experimental groups was executed randomly after selection of uniform sample of the tested. The received results were processed by methods of mathematical statistic with the help of SPSS computer program. We calculated indicators of descriptive statistic and compared samples by Student's method.

RESULTS

Results of the researches showed that autogenous training substantially influences on heart beats rate indicators. Change of this indicator is especially noticeable in the first week of autogenous training practicing. For example, during first week autogenous sessions heart beats rate (HBR) in rest reduced by 11.6%, indicator of mode of RR intervals' duration increased by 7.6%, amplitude of mode of RR intervals' duration reduced by 31.2%. The most noticeable were the changes of the following indicators: variation magnitude of RR intervals (increased by 23%); index of tension (IT) (reduced more than by 50%), (see table 1).

The obtained data show that there is significant influence of autogenous training on vegetative nervous system. For example, reduction of HBR in rest indicators, amplitude of mode of RR intervals' duration, indices of regulatory systems' tension witness about decrease of central and sympathetic impacts. Increase of mode of RR intervals' duration says about increased activity of para-sympathetic vegetative nervous system (Baevskij, 1989). Such changes are confident at $p<0.01$ and some of them – at $p<0,001$.

However, in the second and third weeks of experiment changes of heart beats rate were not so expressed. It is connected with reduction of HBR initial indicators and indicators of mode of RR intervals' duration. It witnesses about increase of economic character of cardio-vascular and nervous system's operation and reduction of energy consumption in rest state. The received results witness about improvement of functional state of the tested from experimental group, resulted from the experiment.

As per our observations in the third week of experiment some tested demonstrated even increase of amplitude of RR intervals' duration mode, tension index of RR intervals' duration and decrease of RR intervals' duration mode and variation magnitude of RR intervals' duration. It witnesses about increase of sympathetic nervous system's activity and weakening of para-sympathetic vegetative nervous system's activity.

The received facts witness about adequacy of recreational processes in third week of experiment and connected with it increase of sympathetic nervous system's tonus increase.

Comparative assessment of functional state of experimental and control groups' members showed absence of statistically confident differences between them before experiment. Such assessment also witnesses about presence of the mentioned differences practically by all parameters after experiment.

In control group there was confident change of indicators of RR-intervals' variation magnitude, RR-intervals' mode and tension index of regulatory systems. However, these changes are confident at less significance level that in experimental group (see table 2).

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Table 1 Indicators of heart beats rate before and in the process of autogenous training in first, second and third weeks of experiment of experimental group 55-60 years' age men (n=28).

Term of registration+A2:F18	Heart beats rate indicators	Before AT	During AT	t-criterion of Student	p
		$\bar{x}$ ±S	$\bar{x}$ ±S		
1st week	HBR in rest, bpm $^{-1}$	86.15±6.71	76.1±5.8	2,48	<0.05
	Mode of RR-intervals, sec.	0.67±0.04	0.72±0.08	4,33	<0.01
	Mode of RR-intervals' amplitude, %	46.6±6.5	32.05±5.7	7,45	<0.001
	Variation magnitude of RR-intervals, sec.	0.13±0.06	0.16±0.16	8,67	<0.001
	Tension index of regulatory systems, conv.un.	148.5±17.7	74.0±10.41	7,95	<0.001
2nd week	HBR in rest, bpm $^{-1}$	80.0±12.0	67.33±9.01	1,51	>0.05
	Mode of RR-intervals, sec.	0.82±0.02	0.73±0.03	0,06	>0.05
	Mode of RR-intervals' amplitude, %	38.0±3.46	32.6±1.15	3,61	<0.01
	Variation magnitude of RR-intervals, sec.	0.23±0.08	0.31±0.16	4,56	<0.01
	Tension index of regulatory systems, conv.un.	62.1±19.9	56.5±12.2	2,35	<0.05
3rd week	HBR in rest, bpm $^{-1}$	70.2±9.1	72.3±5.8	1,37	>0.05
	Mode of RR-intervals, sec.	0.87±0.18	0.9±0.22	1,54	>0.05
	Mode of RR-intervals' amplitude, %	32.0±2.0	28.7±1.1	2,08	>0.05
	Variation magnitude of RR-intervals, sec.	0.29±0.10	0.34±0.12	0,02	>0.05
	Tension index of regulatory systems, conv.un.	74.71±11.7	63.36±18.6	2,87	<0.05

Notes: HBR – heart beats rate; AT- autogenous training.

Table 2 Heart beats rate indicators in control (n=26) and experimental (n=28) groups of 55-60 years' age men before and after experiment.

Indicators	Group	Before experiment $\bar{x}$ ±S	After experiment $\bar{x}$ ±S	p
Variation magnitude of RR-intervals, sec.	Control	0.16±0.07	0.21±0.09	<0.05
	Experimental	0.13±0.06	0.34±0.12	<0.001
Mode of RR-intervals, sec.	Control	0.69±0.06	0.74±0.18	<0.05
	Experimental	0.67±0.04	0.87±0.18	<0.001
Amplitude of RR-intervals' mode, %	Control	41.4±4.4	39.0±2.0	>0.05
	Experimental	46.6±6.5	32.0±2.0	<0.05
Index of tension of regulatory systems (H), conv.un.	Control	142.5±15.4	121.4±19.6	<0.05
	Experimental	148.5±17.7	74.71±11.7	<0.001

DISCUSSION

Results of our researches are in good agreement with opinions of other authors in respect to the following aspects of aged people's health:

- Psychological welfare is closely connected with longevity and positively correlates with age (Venturelli et al. 2012; Heidrich, 1999; Homan, 2016);
- Physical welfare is a substantial predictor of personal satisfaction (Heidrich and Ryff, 1995; Korobeynikov, 2002; Tangri et al., 2003);
- Spirituality (religion) plays important role in physical health (Musick et al., 2000; Shephard, 2014; Gliemann et al., 2016).

Relevance of application in our researches of model of means' alternation for strength, quickness and endurance development in people with different psycho-physical constitution is proved by the data of other authors (Tiffany and Tiffany, 1996). The authors present four-factorial interactive model of physical, psychological and ecological processes, connected with sense of adults' self-control with accent on later life stages (Tiffany and Tiffany, 1996).

The received results of heart beats rate changes witness about harmonizing influence of the worked out autogenous methodic in combination with psycho-physical exercises of special qigong gymnastic on state of cardio vascular and nervous systems. It is connected with the fact that the character of reaction to autogenous training's influence depends on organism's demands. At the beginning of practice with insufficiency of recreational processes there occurs activation of recreational processes and increase of para-sympathetic nervous system's tonus. At the end of experiment there happens activation of sympathetic nervous system.

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The received results permit to work out systems of different means and methods for increase of mature and aged people's functional state application. It facilitates slowing of ageing processes and activation of adaptation mechanisms, directed on compensation of negative changes in organism caused by age. In our system we marked out three directions in physical culture of mature and aged people (see fig. 1).

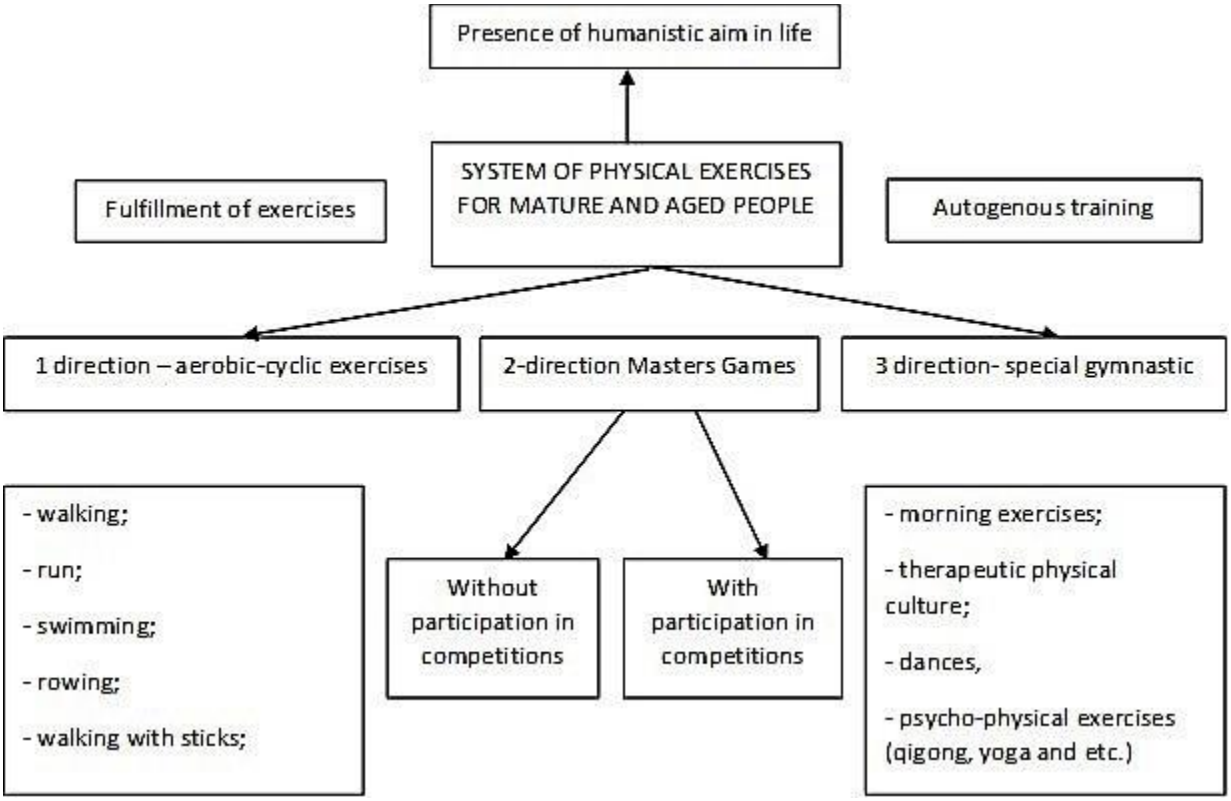

Figure 1. The structure of psycho-physical means' system for rising of mature and older people's functional status.

First direction is connected with usage of aerobic exercises of moderate intensity during period from 20 minutes to 2 hours. These exercises include:

- walking in moderate temp from 40 minutes to 2 hours with HBR 90-130 bpm $^{-1}$;
- run at slow speed from 15 to 30 min. at HBR 120-140 bpm^{-1}, subjective assessment of load shall be within "Light – a little below average";
- bicycle racing at "comfortable" speed up to 2 hours at HBR 110-130 bpm^{-1}, subjective assessment of load shall be within "Light – a little below average";
- skiing at "comfortable" speed up to 1 hour, HBR 120-140 bpm^{-1}, subjective assessment of load shall be within "Light – a little below average";
- swimming at "comfortable" speed up to 45 minutes at HBR 100-120 bpm, subjective assessment of load shall be within "Light – a little below average";
- Nordic walking;
- hiking or hiking of 1st category (walking, water-bicycle and so on).

Such kinds of exercises include all cyclic movements, fulfilled in moderate temp and lasting more than 15 minutes. Such exercises activate mechanisms of aerobic energy supply of muscular functioning and are directly connected with development of cardio-vascular and respiratory systems. Such exercises, lasted more

than 45 minutes, are fulfilled at the account of fats splitting. In this connection aerobic exercises are the most adequate for mature and older people. They permit to reduce risks of cardio vascular system's diseases and strengthen organism's general functional status.

Second direction is connected with practicing one or another kind of sports, including Masters Games. This direction is especially acceptable for those who, being young, actively practiced sports (for example, former sportsmen). At present there exists International Masters Games Association; veterans' competitions of volleyball, basketball, sport orientation; boxing and swimming are practiced. Such direction is useful by its facilitating activation of psycho-physical potentials. It permits for a person to return to the world of game youthfulness, to feel himself again young. Besides, Masters Games facilitate further perfection of tactic skillfulness, permits to feel new features of technique of some sport elements. In this connection Masters Games facilitate maintaining and further progress of intellectual abilities. It is especially important for mature and aged people.

Third direction is connected with application of psycho-physical means for rising of aged people's functional potentials. These means include exercises of special gymnastic with qigong elements; different a-cyclic exercises. They are:

- standard complexes of morning hygienic exercises;
- special complexes of therapeutic physical culture for prophylaxis and treatment of different diseases;
- dances: they permit to activate metabolic processes and facilitate emotional saturation and creative self-expression;
- *complexes of psycho-physical exercises, implying concentration on some images in the process of fulfillment. These complexes include yoga, qigong and Tai Chi systems (Bian, 1989).*

Application of one of this system's aspects (psycho-physical means) permits to raise functional status of aged people. One of acting components of these means is concentration on different images in the process of exercises' fulfillment and autogenous training.

It should be noted that autogenous training activates para-sympathetic nervous system and inhibits sympathetic nervous system. As it is known the most favorable conditions for recreational processes appear with increase of para-sympathetic nervous system's activity with simultaneous inhibition of sympathetic sector (that takes place in sleep). During autogenous training analogous changes take place, that witness about positive influence of autogenous training on recreational processes. Such approach permits to effectively and quickly form conditions for organism's reliable recreation that facilitate increase of trainings' effectiveness.

Autogenous training, combined with special exercises qigong, causes changes, required for organism's economic functioning. Changes of heart beats rate under influence of autogenous training are individual, though the described regularity is characteristic for all the tested. The difference between individuals is in degree of heart beats rate changes and time of beginning of sympathetic nervous system's activation. The received data witness about individual influence of autogenous training and the most adequate changes, caused by it.

There is an opinion about positive influence of humanistic life aim on functional status. Thoughts of different scientists about overcoming of ageing witness that the healthiest are the people, who have life tasks and desire to live. For example, French writer and philosopher Simona de Bauvoir noted the following in respect

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to ageing: in order for ageing not to become a ridiculous parody on our life, there exists only one mean – to aim the targets, which give sense to our existence… Human life has sense only until he (her) brings sense in lives of other people with the help of love, friendship, compassion and protest against injustice (Appignanesi, 2005).

The same thought was expressed by German philosopher Arthur Schopenhauer. He wrote, that there was no higher consolation in old age than awareness of the fact that in young age all forces were devoted to deed, which does not ageing. (Schopenhauer, 1980). And finally, we render the assertion of German writer – Noble prize winner in literature 1929, Thomas Mann. He wrote that man is young or old depending on how he feels himself (Mann, 1937).

In this connection, application of physical exercises system by mature and older people (both all system and its separate components) activates feeling of youthfulness and is of great importance for rising of vital tonus, preservation of health and workability. In this case inner world, spiritual and intellectual treasures of aged people prolong their existence.

CONCLUSIONS

1. We worked out a variant of autogenous training, which implies visualization of certain images. Such approach facilitates relaxation and creation of rejuvenation and health improvement image. On the base of Taoist health related physical exercises we worked out special gymnastic.
2. Autogenous training, combined with qigong special exercises causes changes, required for organism's economic functioning. Autogenous training substantially influences on heart beats rate indicators. Changes of this indicator are especially noticeable in first week of autogenous training.
3. The received results permit to develop system of application of different means and methods for improvement of mature and aged people's functional status. Such approaches facilitate reduction of ageing temps and activation of adaptation mechanisms for compensation of negative changes in aged people's organisms. We marked out three directions in physical culture for mature and aged people.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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