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The scientific electronic periodical journal 'Sports Science and Human Health' highlights the results of scientific research in different fields of sports, physical education, physical culture, sports medicine, physical therapy, ergotherapy, modern recreational and health-improving technologies, as well as research related to human health and those to be valuable for ensuring the innovative development of Ukraine.

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## RECREATION EFFECT OF THE 'STRETCHING' SYSTEM ON THE PHYSICAL AND PSYCHOLOGICAL STATE OF MIDDLE AGED WOMEN

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C – data analysis and interpretation; D – paper writing; E – paper editing;  
F – paper final adoption.

### Abstract

*Introduction.* Today, the Stretching system is an effective way to increase the level of physical activity of middle-aged women. The introduction of elements of the "Stretching" system in the author's fitness programs at the "Faktura" fitness center in Kyiv encourages the study of their impact on the physical and psychological condition of women.

The *aim* of this work is to study the impact of physical culture and health classes using the system "Stretching" on the physical and psycho-emotional state of middle-aged women.

*Material and methods.* In the course of the research the following methods were used: analysis of a scientific writer on the research topic, questionnaires, flexibility tests using exercises for spinal mobility, methods of mathematical statistics. The research was conducted on the basis of Fitness Studio "Invoice" in Kyiv. The study involved middle-aged women aged 21-35, who are engaged in a fitness studio (a total of 64 people).

*Results.* As a result of the study, it was found to improve flexibility, increase the level of physical performance, physical fitness of women. During the study, it was found that in the structure of motivation of middle-aged women to exercise using the "Stretching" system in the first place is a preventive and health motive.

*Conclusions.* In the course of the study it was found that in addition to improving flexibility, classes using the "Stretching" system help to increase the level of physical performance, physical fitness of middle-aged women. In the structure of motivation of middle-aged women to classes using the means of the "Stretching" system in the first place is a preventive and health motive.

**Key words:** middle-aged women, stretching, pilates, physical condition, psychological state, health.



**Introduction.** In Ukraine there is a variety of special recreation fitness centers and clubs providing complex service including popular fitness programs and technologies. Health protection and promotion among women during the first period of middle age is one of the important tasks in the sphere of physical education. Physical state deterioration among women during the first period of middle age is of functional nature and this process can be slowed down, and physical performance can be kept operational by optimizing the motivation regimen and engaging women to exercising in fitness centers. The latest tendencies of fitness programs' development do not bother the development and implementation of the author's fitness programs. The well-known branches of mental fitness such as «Pilates» and «Stretching» have gained a specific niche in the rating of fitness programs being implemented both in group and individual forms of work with women.

According to modern Ukrainian [1, 2, 3, 4, 5, 6] and foreign scientists [7, 8, 9, 10], the «Pilates» and «Stretching» systems are efficient ways of preventing musculoskeletal system disorders and increasing the women's physical activities. Modern specialists in fitness are trying to systemize the data on the impact of stretching classes on the functional state of women aged from 21 to 35 years old, to determine the peculiarities of applying the «Stretching» system for functional disorders' correction, and to examine the impact of the «Stretching» system on the development of middle-aged women's physical qualities.

Along with that, the analysis of literary data claims lack of studies

showing recreational impact of the «Stretching» system on physical and mental state of middle-aged women.

**The aim of the work** is to theoretically substantiate and experimentally study the impact of physical education and recreation classes using the means of the «Stretching» system on physical and psycho-emotional state of the middle-aged women.

**Material and methods.** Aiming to study the motivation and interests of women to recreational fitness classes during the first period of middle age we used the questionnaire. By means of generalization of the answers to the survey questions, we got objective information about the attitude of the women of the first period of middle age to different kinds of recreational fitness classes.

To assess the components of physical fitness the group of tests was used. We assessed flexibility using the exercises «Forward bend» and «Forward bend with knee bent while lying on exterior foot arch». Spinal mobility and elasticity of muscles and ligaments were assessed by maximal forward bend of the core (cm) with knee joints straight. The ruler with zero mark is placed by the thighs. The person examined touches the mark with their fingers lower or higher than the zero mark and keeps this position not less than 2 s. The test was conducted 3 times in a row and the best result correlating with the scale was counted (*table 1*).

The research was conducted on the basis of the «Faktura» Fitness Studio in Kyiv. The study involved middle-aged women engaged in the fitness studio (a total of 64 people).



Table 1

**The scale of lumbar spine flexibility level and elasticity of muscles and ligaments**

| Lumbar spine flexibility level and elasticity of muscles and ligaments (cm) |                           |                |                            |             |
|---|---------------------------|----------------|----------------------------|-------------|
| <i>low</i>  | <i>lower than average</i> | <i>average</i> | <i>higher than average</i> | <i>high</i> |
| 7   | 10                        | 14             | 17                         | 20          |

**Results of the research and discussion.** The main reason for the middle-aged women to choose recreational fitness classes using the means of the «Stretching» system for themselves is a positive impact on psycho-emotional state: 32% of participants of the study reported that.

In addition, the important factors for the women to choose the classes according to the «Stretching» system were: exercise completion rate – 2.2%, maximal recreational effect – 25.4%, increase of joint mobility – 28.8%, calm music accompaniment – 7.3%, and learning to breathe correctly – 4.3%.

Answering the question «Which

tasks do you accomplish by means of classes according to the «Stretching» system?» most women had put posture correction on the first place, desire to get rid of pain in dorsal spine – on the second place, and recovery of joint mobility – on the third place (*table 2*).

As an alternative, social motivation, namely an opportunity to communicate and popularity among friends play the least significant role when choosing this category of physical activity by women.

We assume that such results can be explained by the women’s conscious choice and their autonomy and independence while choosing physical activity.

Table 2

**Analysis of motivation encouraging middle-aged women for classes according to the «Stretching» system, (n=64)**

| <i>Motivation</i>                     | <i>Place in the rating</i> | <i>%</i> |
|---------------------------------------|----------------------------|----------|
| body shape correction                 | 1                          | 50       |
| flexibility correction                | 2                          | 23       |
| well-being                            | 3                          | 14       |
| eagerness to self-improve             | 4                          | 8        |
| communicating with like-minded people | 5                          | 3        |
| popularity among friends              | 6                          | 2        |

In the structure of motivation of women during the first period of middle age to do classes according to the «Stretching» system preventive and recreation motivation is in the first place, aesthetic one is in the second place, psycho-emotional one – in the third, and social cognitive is in the last place. It was

established that the most significant motivation for the women of this age group to attending the classes according to the «Stretching» system is «preventive and recreation» motivation.

Also aesthetic motivation takes a high position in the hierarchy of values. On the contrary, social cognitive



motivation appeared to have the least impact on the women's desire to exercise according to the «Stretching» system.

Thus, we can claim that middle-aged women attend the classes consciously solving exact recreational tasks.

In addition, due to the results of the questionnaire it was revealed that there is the existence of specific motivations causing the women's interest in the «Stretching» system different from the motivations encouraging them to do other kinds of fitness. As visible changes in well-being and psycho-emotional state stimulate the women to continue doing recreational fitness, in the course

of the study we carried out the analysis of the «Stretching» system classes' impact on psycho-emotional state of the middle-aged women.

As answering the question «What impact did the classes according to the «Stretching» system have on your psycho-emotional state?» the first things the women noted were good mood, restoring normal sleep, as well as better poise they felt in everyday life.

In further research we established the level of these particular psycho-emotional indicators on a 10-points scale and examined their dynamics influenced by the classes according to the «Stretching» system (*table 3*).

*Table 3*

**Analysis of the «Stretching» system means' impact on middle-aged women's psycho-emotional state, (n=64)**

| <i>Impact indicators</i>            | <i>Place in the rating</i> |
|-------------------------------------|----------------------------|
| became more discreet                | 3                          |
| learnt how to think positively      | 8                          |
| staying in a good mood              | 1                          |
| restored normal sleep               | 2                          |
| mental endurance increased          | 6                          |
| began to understand my needs        | 9                          |
| became less anxious                 | 5                          |
| restored normal appetite            | 7                          |
| began to respond better to stresses | 4                          |

Investigating the kinds of advantages women feel after stretching classes it was revealed that 6.3% (n=4) did not think about it before or they have nothing to compare with, 18.8% (n=12) undecided which can be explained by a small period of attending classes, but significant percentage of the women felt the advantages of stretching themselves consisting in conscious exercise completion – it is noted by 48.4% (n=31) of the surveyed.

The other kinds of advantages were

put in order by women in the following ratio: smooth pace of exercise completion – 32.8% (n=21), control of breath – 28.1% (n=18), selective influence of exercises – 18.8% (n=12).

As we can see, conscious exercise completion as well as its slow and smooth pace appeals to middle-aged women the most.

We studied specific indicators of physical fitness of the middle-aged women exercising according to the «Stretching» system. To assess the



development of flexibility we used quite a well-known formula:

$$F = (R - AJS) : AJS,$$

where F is flexibility (mm or cm);  
R is value of forward bend (mm or cm);  
and AJS is aged-dependent judgement

standard.

Due to executing control measures the specific indicators of physical fitness of this category of women were determined (*table 4*).

*Table 4*

**Assessment of specific indicators of middle-aged women's physical fitness, n=64, M±SD**

| <i>Testing</i>  |   | <i>Statistical average data</i> |
|---|---|---------------------------------|
| Flexibility   |   |                                 |
| Forward bend, cm  |   | 8.75 ± 1.05                     |
| Forward bend with knee bent while lying on exterior foot arch, cm | R | 7.59 ± 0.76                     |
|   | L | 6.73 ± 0.65                     |

The analysis of the flexibility indicators claimed that the women's forward bend resulted in (10; 5.06 cm). Yet forward bend with right knee bent while lying on exterior foot arch resulted in (7; 5.26 cm), and with left knee bent – (7; 6.08 cm).

Distributing the women by the flexibility level claimed that in general, the women surveyed were characterized by low level and lower than average level of development of the mentioned quality: the women categorized by indicated groups were revealed 45.3 % (n=29) and 31.3 % (n=20), accordingly.

Thus, during the survey insufficient level of flexibility development among middle-aged women was proved.

As a result of the study, it was determined that except improvement of flexibility indicators, the classes using the means of the «Stretching» system contribute to increasing the level of women's physical performance and physical fitness.

Thus, during the study it was proved that the indicators of physical development of the control group after the classes using the means of the «Stretching» system improved (*table 5*).

*Table 5*

**The indicators of physical development of the women of the control group aged 21 to 35 before and after the experiment, n=32, M±SD**

| <i>Physical development indicators</i> | <i>Statistical average data</i> |                      |
|--|---------------------------------|----------------------|
|  | before the experiment           | after the experiment |
| Body length, cm                        | 167,69 ± 0,03                   | 167,75 ± 0,5         |
| Body mass, kg                          | 65,91 ± 1,02                    | 64,53 ± 1.4          |
| Chest circumference, cm                | 91,03 ± 0,50                    | 90,84 ± 0,35         |
| Thighs circumference, cm               | 95,44 ± 0,45                    | 95,28 ± 0,32         |
| Right thigh circumference, cm          | 54,53 ± 0,20                    | 54,47 ± 0,20         |
| Left thigh circumference, cm           | 54,16 ± 0,20                    | 54,09 ± 0,20         |





In the course of comparative analysis it was revealed that during the classes according to the «Stretching» system physical development of the women aged 21 to 35 was increasing having impact on the level of flexibility development. Statistically significant correlation  $p < 0.05$  was revealed for these indicators (*table 6*).

So, the classes using the means of the «Stretching» system have a positive impact on the indicators of middle-aged women’s physical development. As we see it, such results are associated with the fact that most participants of the experiment had body length to body mass ratios corresponding to their age norm.

*Table 6*

**Indicators of physical fitness of the women aged 21-35 after the experiment, n=64**

| Test content  |   | Statistical average data |      |      |     |                    |      |      |     |
|---|---|--------------------------|------|------|-----|--------------------|------|------|-----|
|   |   | Control group            |      |      |     | Experimental group |      |      |     |
|   |   | Me                       | 25 % | 75 % | S   | Me                 | 25 % | 75 % | S   |
| Forward bend, cm  |   | 12.0                     | 6.5  | 15.0 | 5.1 | 13.0               | 8.5  | 15.0 | 4.6 |
| Forward bend with knee bent while lying on exterior foot arch, cm | R | 11.0                     | 9.0  | 13.0 | 4.8 | 11.0               | 7.5  | 15.5 | 4.9 |
|   | L | 11.0                     | 7.0  | 12.0 | 5.4 | 10.0               | 5.5  | 14.0 | 6.0 |

Studying the impact of the classes using the means of the «Stretching» system on the organisms of the middle-aged women we used the criteria of recreational trainings’ efficiency among which the prominent place was given to increasing functional backups of the exercisers’ organisms. So, the classes using the means of the «Stretching» system have a positive impact on middle-aged women’s physical fitness.

the «Stretching» system have a positive impact on the dynamics of psycho-emotional state indicators among women aged 21 to 35, namely: the mood became better and sleep considerably improved, the psycho-emotional state indicators of the middle-aged women increased which represents the efficiency of the classes using the means of the «Stretching» system in such age (*table 7*).

Thus, classes using the means of

*Table 7*

**The indicators of psycho-emotional state of the women aged 21-35 before and after the experiment (in points, n=64, M±SD)**

| Indicators | Statistical average data |                      |
|------------|--------------------------|----------------------|
|            | before the experiment    | after the experiment |
| Well-being | 3.77 ± 0.24              | 5.35 ± 0.15          |
| Activity   | 2.11 ± 0.11              | 5.12 ± 0.29          |
| Mood       | 4.03 ± 0.21              | 6.48 ± 0.31          |



Our study concludes that motivation structure among the middle-aged women consists of four groups of motivations: preventive and recreation, aesthetic, psycho-emotional and social cognitive motivations. It was revealed that among the women surveyed preventive and recreation motivation was predominant. It was proved that physical development of the middle-aged women was within the norm, but decrease of physical fitness was observed. Such result claims necessity of including exercises designed to develop flexibility into sets of physical exercises for this age group of women.

As such, the efficiency of the recreational training process of the middle-aged women using the means of the «Stretching» system can provide development of special pedagogical conditions which include the following: correlation of the objective of recreation and training process of the women with the peculiarities of their physical and mental state during development of the training program; additional measures on involvement of women in recreational activity and boosting their motivation to ongoing classes by means of creating comfortable training conditions; expanding physical activity by self-training at home; systematic control of physical state and attention to individual feelings of those who exercise; encouraging to go on attending classes by applying innovative media used during the classes; availability of necessary methodological and material as well as technical equipment; clear criteria of assessment the program efficiency recommended according to the «Stretching» system.

In the course of the study, it was revealed that in the structure of middle-

aged women's motivation to exercise using the «Stretching» system preventive and recreation motivation was in the first place, aesthetic one was in the second place, psycho-emotional one – in the third, and social cognitive was in the last place. Analyzing the middle-aged women's motivation to exercise using the «Stretching» system by means of ranging it was revealed that the priority motivations to exercise among this category of women was correction of posture disorders, desire to get rid of pain in different regions of spine, and recovery of joint mobility. At the same time, an opportunity to communicate and popularity among friends were of the least importance when women chose the «Stretching» system as a physical activity.

#### **Conclusions:**

1. The analysis of the physical fitness indicators of the middle-aged women allowed us to establish that 46.9% of the women having taken part in the study had the levels lower than average and low. Yet 25% of the women were overweight. The low level of development of flexibility was recorded. It was revealed that psycho-emotional indicators need correction.
2. The major motivations to exercise using the means of the «Stretching» system among the middle-aged women were correction of posture disorders, desire to get rid of pain in different regions of spine, and recovery of joint mobility. At the same time, an opportunity to communicate and popularity among friends were of the least importance when women chose the «Stretching» system as a physical activity.



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