

VERIFICATION OF THE FOUR-WEEK INTERVENTION PROGRAM "LIFE IN BALANCE" IN A SELECTED GROUP OF SENIORS IN THE ONLINE ENVIRONMENT DURING THE COVID-19 PANDEMIC

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Abstract

The study was realised within the project GAČR 17–25710S „Basic research of changes in the balance of seniors“. The main goal of the study was to verify the four-week intervention program "Life in Balance" in a selected group of senior females in an online environment during the Covid-19 pandemic. The partial goal was to determine the effects of relaxation after exercise at the bio-psycho-social level based on selected methods. The research was carried out in accordance with the above project. According to the intervention method "Life in Balance" focused on elderly persons 65+ (origin of the project GAČR 17–25710S 4) four educational videos of 35 to 40 minutes were developed. The research survey was attended by 7 females aged 65 -79 years. The common feature of the monitored group was the age over 65 years, residence in Prague and no or minimal experience with yoga practice. The following diagnostic methods were used: scenario, educational videos and two standardized questionnaires (POMS and SF-36), which were applied before and after the intervention. Results proved positive changes in all monitored dimensions of POMS. There was a significant increase in the vitality score of the monitored subjects. Positive significant changes in the subjective assessment SF-36 were found in physical, mental and social balance scores in monitored subjects. It may be recommended the intervention program "Life in Balance" for the work of wellness specialists and other experts which work professionally with elderly 65+, and for the next research observation.

Keywords

Breathing techniques; Covid-19 pandemic; educational video; elderly 65+; yoga exercises.

1 INTRODUCTION

During a pandemic, seniors are even more socially distant from their social environment. Isolation and social disconnection have consequences in the form of depression and anxiety. New problems that worsen mental health can then impair cognitive and emotional functions (Jandová, Formanová, & Morávek, 2018; Mukhtar, 2020).

Some seniors are isolated in the so-called "digital divide". Behind this deadline may be a lack of technological resources or a minimal ability and interest to learn new things. At the same time, new online technologies can enrich their lives in many ways. For example regular online yoga exercises keep the body healthy and full of vitality until old age. It has the advantage that it can be easily adapted to the current state of health, condition and

therefore we can practice it at any age. Appropriate yoga exercises help keep the body healthy, firmed and, above all, they can compensate for muscle imbalances that can cause many problems not only for seniors (Stránská, 2021).

We can literally talk about the necessary necessity for an older person to move despite his resistance to any physical activity. Stress is reduced during exercise. Yoga is an effective tool in the fight against depression and anxiety, which is so common in old age (Ballingová, 2018).

Inducing harmony and balance in the body ensures the survival of the individual in a constantly changing environment, such as changes and fluctuations in temperature, humidity, pressure, etc. The central nervous system (CNS) and cardiovascular system play a priority role

in maintaining balance (Krejčí, Hill, Jandová, Kajzar, Bláha, 2019).

The "Life in Balance" intervention program was characterized as a suitable tool for developing balance in seniors, which helps to compensate for lack of exercise. It can also minimize the health consequences of a pandemic. Four educational videos of 35 to 40 minutes were made for senior women, which were preceded by a screenplay (Stránská, 2021).

The research was based on an intervention in a selected group of seniors using the mentioned audio-visual materials. This is a recorded video recording of the intervention program "Life in Balance", which was implemented within the three-year project GAČR 17– 25710S "Basic research of changes in the balance of seniors" and was successfully verified at the College of Physical Education and Sport PALESTRA in 2017-2019.

The whole study was prepared within this project. Two standardized questionnaires were applied before and after the intervention. The POMS questionnaire examined the current mental state and the SF-36 questionnaire assessed the quality of life parameters of the participants. Subsequently, the results of the research were confronted with current literary knowledge. Throughout the conclusion, the obtained data were summarized and briefly described, and the author considered the possible further use of the intervention program in practice. It is very beneficial with this project to contribute to the developing area of Wellness, where body and spirit care the most important. We want to support a healthy lifestyle in the examined senior women, and thus help to their overall balance (Stránská, 2021).

2 AIM, RESEARCH ASSUMPTIONS

The aim of the study was to verify the four-week intervention method "Life in Balance" (Krejčí, 2019) in a selected group of seniors 65+ in the online environment during the Covid-19

pandemic using a series of instructional videos, created within the project GAČR 17–25710S4 (Stránská, 2021). The partial goal was to determine the effects of the applied intervention at the bio-psycho social level in a given age group based on selected methods.

Research assumptions (RA)

RA1: After completing the "Life in Balance" intervention program, participants will have a significant improvement in their vitality scores.

RA2: After completing the intervention program "Life in Balance", there will be a significant improvement in the social level of the participants.

3 METHODS

3.1 Participants

A total of 7 female participants (range 65-79 years; mean age 68.9 ± 3.7 ; median 65), were included in the four weeks intervention. Before the start of the intervention, all participants were acquainted with the course of the intervention. Signing in an informed consent they confirmed their voluntary participation in the research. In the research survey were involved elderly women, who were active, living in own flat. A random stratified sampling was used. The common feature of the observed females' group was the age over 65 years, residence in Prague region and no or only minimal experience with yoga.

3.2 Procedure

Pre and Post the intervention, each participant completed the SF-36 and POMS questionnaires. Each participant was instructed on how to respond to items in the survey and was told to relax and respond truthfully. No time limit has been set for compliance survey. The questionnaires were applied according to the manuals. Each item was analysed for possible intervention effect. Each participant underwent all procedures at once. The

obtained data were stored and protected in accordance with Regulation 2016/679 of the European Parliament and of the Council of the EU. After the PRE measurements, each participant completed, always in the morning from Monday to Sunday, the relevant online video lesson as part of a four-week yoga-based intervention. One day after the four-week intervention, post-measurements were performed with SF-36 and POMS questionnaires under the same conditions.

3.3 Diagnostic methods

RAND 36 Short Form Health Survey (SF-36)

This survey (SF-36) is a valid and reliable indicator of overall health status (Ware, Snow, Kosinski, & Gandek, 1993), and it is widely used all over the world today. It is comprised of 36 items that assess eight categories: physical functioning (10 items), physical role of functioning (4 items), emotional role functioning (3 items), social role functioning (2 items), mental health (5 items), vitality (4 items), body pain (2 items), and general health perceptions (5 items). Responses across the items are scored on the two- to six-point scales. One item (question 2) covers a change in health status over the past year. Therefore, participants in the presented study were not assessed on this item. The method was reported to have a reliability of $r = .65$ to $.94$ across the scales, with a median of $.85$. According McHorney, Ware, Lu, & Sherbourne, (1994) this resulted in very good internal consistency and item-discriminant validity (Krejčí, Psotta, Hill, Kajzar, Jandová, Hošek, 2020). *Questionnaire POMS – Profile of Mood States* (Stuchlíková, Man, Hadgvet, 2005).

It is a very common, fast and economical method that is used to determine the emotional states of respondents. It is mainly used to monitor the effect of short-term intervention or therapy. The POMS questionnaire has two variants (A + B). "POMS A" is used before the intervention and determines the emotional tuning of the respondent

during the last period and asks how the individual usually feels. "POMS B" is used after the intervention and tests the current mental state, or how the individual feels right now. The original version of the POMS questionnaire contained 65 adjectives (McNair, Lorr and Doppleman, 1971). For faster testing, the questionnaire was shortened to 37 adjectives, creating a version of the POMS short form. The shortened version is thus a relevant alternative to the original version of POMS and contains the following 6 factors / dimensions (Pernica, Opočenský, Suchý, 2015):

- T – Tension
- D – Depression
- A – Anger
- V – Vigor
- F – Fatigue
- C – Confusion

The subject gradually evaluates all 37 adjectives on a five-point scale of intensity: not at all (1) a little (2) moderately (3) considerably (4) very considerably.

3.4 Scenario and video sequences realisation

The shooting of all four online intervention video lessons was preceded by the writing of a scenario (Field, 2007), preparation of the environment, techniques, clothing, visages, aids and props for online videos creation (Juilly, 2017). Combining all these factors was not easy and the individual shots had to be repeated during the creation. The creation of four educational cycles required monthly work in one person due to the situation of the Covid-19 pandemic. Therefore, it was not technically possible to record all the records chronologically, because the author (Stránská, 2021) had to include the activities of other staff professions (cameraman, editor, sound engineer, director, lighting, producer, graphic artist, and actor/instructor).



Figure 1 Environment, where the shooting of the intervention "Life in Balance" took place (Stránská, 2021)

The process of editing and sounding (post-production) took place in the iMovie program using a GXT 232 microphone with a pop filter, when it was necessary to record the entire recording. Subsequently, the "PALESTRA" logo was created in the graphic program Adobe Illustrator CC 2018, which was used in the introductory sequential jingle and made introductory and concluding captions.

3.5 Intervention

The four-week yoga based intervention method "Life in Balance" (Krejčí, 2019) was transformed in a series of instructional videos, created within the project GAČR 17–25710S4 by Stránská (2021). Each of educational video was lasting 35 to 40 minutes. Each weekly intervention bears its own name, from which the goal of the whole lesson is based. Each lesson of exercise on is realised always a given day of the week. During the week, participants were motivated to repeat practiced exercises and yoga elements individually. The intervention was focused on body posture and balance control, flexibility, muscle strength, breathing, the stimulation of psychic harmony and the optimization of social interaction. The yoga exercises were carried out in accordance with the system of Yoga in Daily Life (Maheshwarananda, 2000), and without contraindications to the elderly (Sarvahita Asanas), and the movements whilst sitting on a chair or standing. Each

week intervention program also included the motto: Week 1 "You are never alone", Week 2 "Change is always possible", Week 3 "Movement is life", Week 4 "Enjoy life and every moment" (Krejčí, 2019).

4.6 Statistics

Basic descriptive characteristics (central tendency, scatter) were calculated for all variables. A two-tailed paired t-test was used for the SF-36 and POMS questionnaires, which statistically followed the evaluation of the significance of differences between the intervention phases. The calculation is based on paired values of two measurements on one sample (before and after the intervention (Hendl, 2012)). The SF-36 questionnaire was evaluated using a table created by the ÚZIS Association, which shows the quality of life in the given factors as a percentage. After filling in the table, the calculated score will be displayed automatically. The score range is from 0 to 100 points. The higher the number of points, the better the HRQL (health related quality of life). Conversely, a score below 50 is perceived below the population norm and may indicate poorer health or chronic illness. Microsoft Office Excel was used for data analysis.

4 RESULTS AND DISCUSSION

4.1 Results of SF-36 questionnaire

The results Pre and Post intervention data

analyse showed that the percentage change in health is 39.29%, reduction in physical pain at 51.29%. The results after the intervention show that the overall perception of health improved by 1.43%. The highest values were measured for social activity by 12.29%, remission of physical pain by 11.71% and positive

changes in health by 10.71%. In contrast, physical activity and overall mental health did not change (see Table 1).

A two-tailed paired t-test was used to evaluate the individual answers to the questions in the SF-36 questionnaire (see Table 2).

Table 1 Comparison of health qualities before and after the intervention according SF-36 (n = 7 females)

Categories	PRE intervention	POST intervention
Physical activity	81.43%	81.43%
Limitations in role activities because of physical health problems	46.43%	57.14%
Limitations in usual role activities because of emotional problems	61.86%	66.71%
Vitality (energy and fatigue)	57.86%	63.57%
General mental health	74.29%	74.29%
Social functioning	71.71%	84%
Bodily pain	51.29%	63%
General health perceptions	67.14%	68.57%
Perceived change in health	39.29%	50%

Table 2 Statistical evaluation of the SF-36 questionnaire (n = 7 females)

Items	Phase 1		Phase 2		Difference P-value
	Median	Average	Median	Average	
Item 1	3	2.86	3	3.00	0.356
Item 2	3	3.43	3	3.00	0.078
Item 3	1	1.14	1	1.43	0.172
Item 4	2	2.43	3	2.29	0.604
Item 5	3	2.71	3	2.71	1.000
Item 6	3	2.71	3	2.57	0.356
Item 7	3	3.00	3	3.00	undefined
Item 8	2	2.43	2	2.43	1.000
Item 9	3	3.00	3	3.00	undefined
Item 10	3	2.86	3	3.00	0.356
Item 11	3	3.00	3	3.00	undefined
Item 12	3	3.00	3	2.86	0.356
Item 13	2	1.71	2	1.71	1.000
Item 14	1	1.43	1	1.43	1.000
Item 15	1	1.43	2	1.57	0.356
Item 16	1	1.29	2	1.57	0.172
Item 17	2	1.86	2	1.71	0.604
Item 18	1	1.43	2	1.71	0.172
Item 19	2	1.57	2	1.57	1.000
Item 20	2	1.71	1	1.29	0.200
Item 21	4	3.57	2	2.57	0.038
Item 22	3	2.86	3	2.71	0.356
Item 23	3	3.29	2	2.86	0.482
Item 24	5	5.00	5	5.14	0.736
Item 25	6	5.86	6	6.00	0.356
Item 26	3	2.86	3	2.86	1.000
Item 27	4	3.43	3	2.71	0.140
Item 28	5	4.57	5	4.71	0.689
Item 29	4	4.29	5	4.43	0.736
Item 30	3	3.00	4	3.43	0.200
Item 31	4	4.00	4	3.86	0.689
Item 32	3	3.43	4	4.00	0.231
Item 33	5	4.57	5	4.86	0.356
Item 34	2	2.14	2	1.86	0.172
Item 35	4	3.86	5	3.86	1.000
Item 36	3	2.86	3	3.14	0.654

In the item 21 (How much pain did you have in the last 4 weeks?) The biggest significant difference was analysed. Thus, a significant improvement over the original state. The evaluation of the SF-36 Health Quality Questionnaire (compared to pre-intervention results) showed a subjective improvement in 7 of the 9 dimensions (see Figure 2). Overall mental health and

physical activity did not show deterioration or improvement, which may be indicative about 3 subjects who became ill during the research, and this could significantly affect the data obtained in such a small sample. The results confirm the research assumptions of RA1 and RA2.

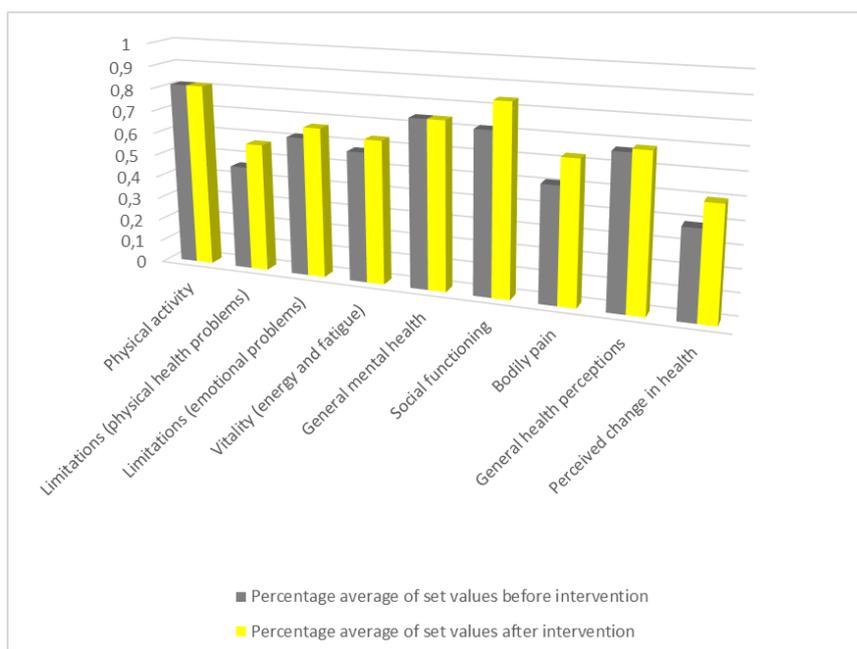


Figure 2 Percentage results of individual health qualities of the SF-36 questionnaire - comparison before and after the intervention (n = 7 females)

4.2 Results of the questionnaire Profile of Mood States (POMS)

Table 3 lists all dimensions of the current mental state of the tested participants according to the POMS questionnaire before and after the intervention. Characteristics include mean, median,

standard deviation, range of variation, and maximum and minimum values of all participants. The “Vitality” dimension reaches the largest variations, while a decrease is recorded in Anger” and “Tension”.

Table 3 Significance of individual dimensions of POMS after the intervention for bilateral pair distribution (n = 7 females)

	P-value from the two-pair T-test	Arithmetic mean 1	Arithmetic mean 2	Difference
TENSION	0.102	0.786	0.524	-0.26
DEPRESSION	0.043	1.009	0.429	-0.58
ANGER	0.021	0.879	0.286	-0.59
VITALITY	0.208	0.879	1.762	0.88
FATIGUE	0.129	0.935	1.086	0.15
CONFUSION	0.860	1.089	0.657	-0.43

Figure 3 shows the shift of individual categories of emotional states before and after the intervention "Life in Balance". The significant shift was found in the "Vitality" dimension. The intervention influenced a great improvement in the

dimension of Vitality generally. On the contrary, the largest decreasing was recorded in the "Depression" and "Anger" dimensions. The "Fatigue" dimension increased slightly after physical exercise.

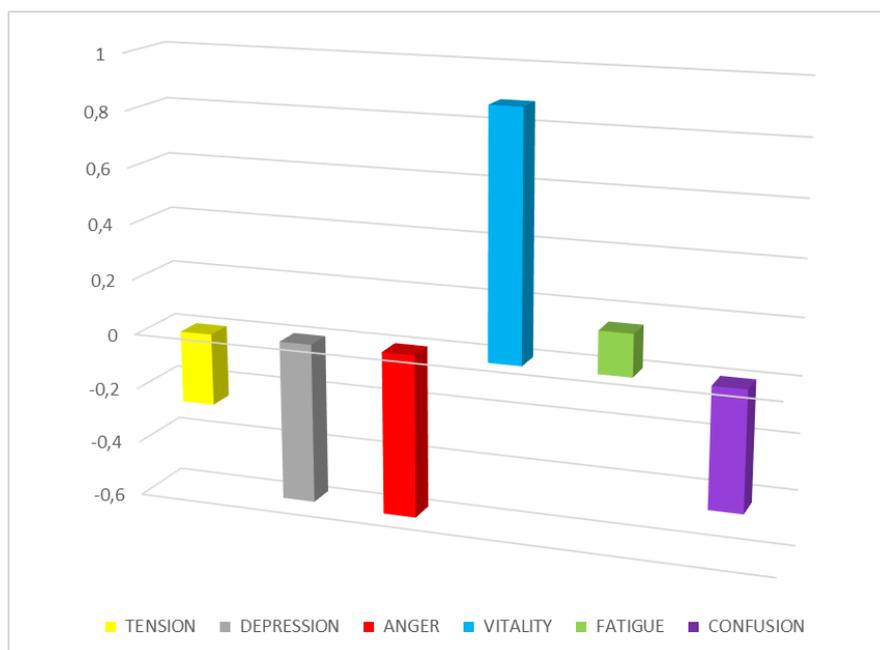


Figure 3 Shift in the values of emotional states of dimensions POMS after the intervention (n = 7 females)

Presented results verify the research assumptions of VP1 and VP2. The "Life in Balance" intervention demonstrated on the basis of POMS questionnaires and SF-36 significant changes in subjective assessment of health and emotional state for the examined file. The obtained results show an improvement in mental, physical and also significantly in the social sphere in the monitored elderly female participants.

4.3 Discussion to the presented results

The aging process is scientifically observed at the bio-psycho-social levels. One of the answers to slow down changes and defects in an aging organism is to establish an important and often neglected balance in all areas of human life. Balance control plays a significant function for physical activity in seniors. An intervention based on the practice of yoga leads to the beneficial maintenance of

their physical and mental balance. On the contrary, uncertainty of movement (dyskinesia) negatively affects the well-being of senior women in a bio-psycho-social context. (Krejčí, Psotta, Hill, Kajzar, Jandová, Hošek, 2020).

4.3.1 Discussion on the results of the SF-36 questionnaire

Surprisingly, the SF-36 subjective health assessment questionnaire had the lowest percentage change in health, which may indicate little confidence in the study group. It follows that without adequate self-assessment we can talk about the overall disintegration of the personality based on social disorientation, unrealistic understanding of oneself, on a vague and poorly structured image of one's own person, which does not allow correction of one's own actions. If an individual sees a hopeless path in changing his or her

health, he or she cannot fully improve on his or her own strength (Krejčí, Hošek et al, 2016).

The loneliness of seniors during a pandemic is alarming. After the intervention, it was confirmed that the social health of the participants increased rapidly. The value in the SF-36 questionnaire measured for social activity reached the highest difference of all dimensions by up to 12.29%. This is in line with Belling's (2018) statement that yoga practice expands the possibilities of social contact and thus has an antidepressant effect.

Furthermore, the data obtained from the SF-36 questionnaire did not show any changes in overall mental health. Nevertheless, there has been an improvement in the item with emotional problems. This is consistent with the results of a short-term survey of a similar intervention in older men (Krejčí et al, 2020).

4.3.2 Discussion on the results of the POMS questionnaire

Sinclair (2019) mentions that there are several stressors that activate only longevity genes but do not damage cells. These include certain types of physical exercise. Yoga exercises are very suitable, which helps to maintain the just mentioned balance, and thus increases the quality of life not only in senior age. The results of the Profile of Mood States (POMS) questionnaire showed that there was a significant increase in vitality after the intervention. This agrees with the author's assertion that the most appropriate path to vitality is through movement.

The obtained results correspond to the conclusions published in the professional publication "Basic research of changes in the balance of seniors", published by the College of Physical Education and Sport PALESTRA. The applied intervention confirmed significant positive changes and health benefits. The results agree on vitality, subjective feeling of happiness and improvement in social health (Krejčí et al, 2019).

4.3.3 Discussion to the intervention program realisation

The intervention method has been validated in other studies. The results to some extent coincide with the measurement and testing of Náprstek, Krejčí, Kajzar, Hill (2019), who devoted himself to the same verification of the intervention wellness program "Life in Balance" in the conditions of a spa stay in Lázně Jupiter Bechyně for seniors 65+. The mentioned author had the opportunity to implement the program 67 in the pre-covid-19 period and its results are more obvious. The author further states that the research participants' interviews showed that they would like to welcome the intervention program at home (Náprstek, Krejčí, Kajzar, Hill, 2019).

The current Covid-19 period just requires this distance form of teaching and practice. The study carried out the project in an online environment. From the personal experience of the author, the following feedback reactions were found in participants:

- Enthusiastic about the possibility of exercise despite all government measures;
- Recommendation of the intervention program to their loved ones;
- The technical equipment and literacy of senior women was in many cases limiting and required the help of their family members;
- The inexpensive economic aspect of the project;
- "Amateur joy" from the positive effects of exercise in four weeks;
- Possibility of constant regular repetition (flexibility and time mobility of the program);
- The educational nature of the health promotion program.

Nevertheless, the results confirm the overall improvement of the subjective

perception of the quality of health, including the social sphere, based on the use of exercise, relaxation and breathing techniques and methods.

According Krejčí, Hošek et al. (2016) every individual is a complex organism that must balance all areas of human health (spiritual, physical, social, mental). If only one of the four determinants of health is violated, there is an overall breakdown of other areas that are interdependent.

This confirms the need for physical activity to improve overall health, especially in the older generation. Participants were very limited in vitality and physical activity before the intervention. The "Life in Balance" intervention program leads to a state of well-being and an overall improvement in physical and mental balance.

5 CONCLUSIONS

The research showed that the educational medium in the form of a cycle of four educational videos is suitable and usable for seniors both in their home environment and in a home for the elderly or in another facility. All participants practiced with interest and regularly. Based on the results, it can be stated that there was an improvement in the physical condition and mental well-being of the monitored women after the intervention. The results also show that the examined group showed a significant improvement in the area of social level and vitality. There was also an improvement in the subjective assessment of health perception, including a reduction in common pain during daily activities.

The intervention has been shown to help improve physical ability and maintain balance control in age 65+. Thus, the intervention contributes to the prevention of the reduction of incidents of falls in old age and to the prevention of risk factors for diseases of civilization. Early primary and secondary prevention is very essential. Last but not least, the influence of a pleasant environment and the selection of suitable

comfortable and sportswear plays an important role here. However, the senior should know that the effects of yoga are visible only after a certain time. As a reward for consistency and regularity in exercise, is a return to active life.

We recommend the intervention, presented in this study, to further verification in practice. We recommend to use the recorded series of video as a teaching tool in universities, in senior homes, rehabilitation centres and all facilities focused on the care of the elderly.

Conflict of Interest

There is no conflict of interest.

Acknowledgement

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