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## Porównanie wpływu serii masażu klasycznego i aromaterapeutycznego na parametry kardiologiczne u pacjentów z bólem odcinka szyjnego kręgosłupa

### Comparison of the effect of classic massage and aromatherapy on cardiac parameters in patients with cervical spine pain

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#### Streszczenie

*Wstęp:* Przewlekły ból odcinka szyjnego kręgosłupa jest drugim, po bólu odcinka lędźwiowego, najczęstszym objawem dyskomfortu układu kostno – stawowego odczuwanego przez pacjentów. Istnieje wiele metod postępowania leczniczego, mających na celu likwidację objawów towarzyszących bólowi kręgosłupa. Jedną z nich jest masaż.

Celem pracy jest ocena wpływu masażów aromaterapeutycznego oraz klasycznego na parametry ciśnienia i tętna u pacjentów z bólem odcinka szyjnego kręgosłupa.

*Materiał i Metody:* Badaniem została objęta grupa 46 osób obojga płci w wieku od 20 do 45 lat z bólami przewlekłymi odcinka szyjnego kręgosłupa. Badanych podzielono na dwie grupy

terapeutyczne. W Grupie I wykonano serię 10 masaży aromaterapeutycznych. W Grupie II przeprowadzono serię 10 masaży klasycznych. U każdego badanego przeprowadzono wystandaryzowaną skalę NDI. Przed przystąpieniem do zabiegów i po wykonaniu serii masaży dokonano pomiarów poziomu natężenia bólu w skali NRS. Pomiar ciśnienia skurczowego i rozkurczowego oraz tętna zostały przeprowadzone przed, bezpośrednio po i 5 minut po masażu w 1, 5 i 10 dniu masażu.

*Wyniki:* Uzyskane dane wskazują na to, że masaż aromaterapeutyczny wykazywał skuteczniejsze działanie analgetyczne. Masaż klasyczny wykazał istotnie statystyczny spadek ciśnienia skurczowego i rozkurczowego w 5 minucie po zakończeniu zabiegu (w 5 i 10 dniu terapii) i po całej serii masaży ( $p < 0,05$ ). W Grupie I i II zauważono istotny statystycznie ( $< 0,05$ ) spadek tętna bezpośrednio po zakończeniu masażu tylko w 1 dniu terapii.

*Wnioski:* Zabiegi masażu klasycznego wpływają na zmianę parametrów ciśnienia krwi i tętna bezpośrednio po masażu oraz 5 minut po masażu. Masaż aromaterapeutyczny wykazuje lepsze działanie analgetyczne niż masaż klasyczny, na co należy zwrócić uwagę podczas doboru terapii u pacjentów z bólem kręgosłupa.

Słowa kluczowe: odcinek szyjny kręgosłupa, aromaterapia, masaż klasyczny, ból, ciśnienie krwi, tętno.

## Summary

*Admission:* Chronic pain of the cervical spine is second, the lumbar pain, the most common symptom discomfort bone - joint experienced by patients. There are many methods of treatment, aimed at eliminating the symptoms associated with back pain. One of them is the massage.

The aim of the study is to assess the impact of aromatherapy massages and classic parameters pressure and heart rate in patients with pain of the cervical spine.

*Material and methods:* The study group has been acquired 46 people of both sexes aged 20 to 45 years with chronic pain of the cervical spine. The subjects were divided the two treatment groups. In Group I donea series of 10 aromatherapy massages. In Group II conducted seriesę 10 classical massage. In each test was carried out standardized scale NDI. Before treatments and massages after a series of measurements were made in the level of intensity of pain NRS. Measurements of systolic and diastolic blood pressure and pulse rate were carried out before, immediately after and 5 minutes after the massage in 1, 5 and 10 day massage.

*Results:* The data obtained suggest that aromatherapy massage showed a better analgesic effect. Classic massage showed a statistically significant decrease in systolic and diastolic pressure 5 minutes after the treatment (at 5 and 10 days of treatment) and after a series of massage ( $p < 0.05$ ). In Group I and II noted statistically significant ( $< 0.05$ ) drop in heart rate immediately after the massage only on day 1 of therapy.

*Conclusions:* Classical massage treatments affect the changing parameters of blood pressure and heart rate immediately after the massage and 5 minutes after the massage. Aromatherapy massage exhibits superior analgesic effect than classic massage, what to look for when selecting treatment for patients with back pain.

Keywords: cervical spine, aromatherapy, classical massage, pain, blood pressure, pulse.

## Admission

Chronic pain of the cervical spine is the second, after lumbar pain, the most common symptom on the osteoarticular system. It is one of the most common diseases in patients [1]. Back problems cervical complaining of from 30 to 50% of the population [2]. Ailments can cause significant functional impairment, and lower quality of life [3].

There are many methods of treatment, aimed at eliminating the symptoms associated with back pain. One of them is the massage. It has both a local and central. When performing massage, thanks to the sense of touch, can affect basic physiological processes in the body. Affecting the nervous system and a portion of somatic and autonomic [4].

Scientific reports confirm the effect of massage on cardiac parameters, ie. Decrease in blood pressure and heart rate. They also highlight the fact that the massage can be used as adjunctive therapy in the treatment of hypertension caused by stress [4].

Another of the most effective treatments in the methods of treatment back pain is a form of massage using essential oils, namely aromatherapy. Execution of massage oil with a combination of appropriate action can give a patient similar effects as other methods of manual therapy. Using this type of massage, we give the patient the opportunity, depending on the smell, feel different effects on the body depending on the need. Aromatherapy improves mood, relaxes, affects the blood circulation better and better and deeper by the action of the oil allows faster operation [5].

Despite numerous studies on the therapeutic effects of massage without finding out detailed studies on the impact assessment of action of classical massage and aromatherapy on cardiac

parameters and intensity of pain in patients with back pain. This fact has prompted the author's work to take up this topic. The aim of the study was to compare the effects of a series of classical massage and aromatherapy on parameters of blood pressure and heart rate. Comparison of analgesic efficacy of classical massage and aromatherapy massage in patients with cervical spine pain.

#### Material and Method

The study included 46 patients of both sexes (23 women and 23 men) ranging in age from 25 to 45 years (mean age 31.76), reporting pain in the cervical spine of a chronic nature.

The condition of the test was to have the patient referral for medical massage and consent to voluntary participation in the study.

Those eligible were randomly divided into two treatment groups:

- Group I (n = 23), which was carried out a series of 10 massage aromatherapy using essential oil therapy Oil producer Avicenna® the scent of lavender.
- Group II (n = 23), in which a series of 10 was carried out using classical massage neutral lubricant, ie. Olive Ziaja manufacturer Drug Production Plant Ltd sp.

The study received acceptance is Bioethic Pomorskiego Medical University in Szczecin (No. KB-0012/06/17).

For diagnostic procedures consisted of the following: physical examination (questionnaire *Neck Disability Index* and assessment of pain intensity on a scale NRS ang. *Numerical Rating Scale*) and physical examination (measurement of blood pressure and heart rate).

After the diagnosis began to perform treatments. In Group I was made aromatherapy massage, while in Group II classic massage of the cervical spine.

In order to perform a single course of massage among all participants in the study, were used the following scheme (Fig.1). Differentiator both groups was the nature of the lubricant in a Group I oil was therapeutic Avicenna Oil Company of lavender fragrance, while the Group II neutral lubricant, ie. olive Ziaja.

Diagram of the course of massage and duration of the following techniques:

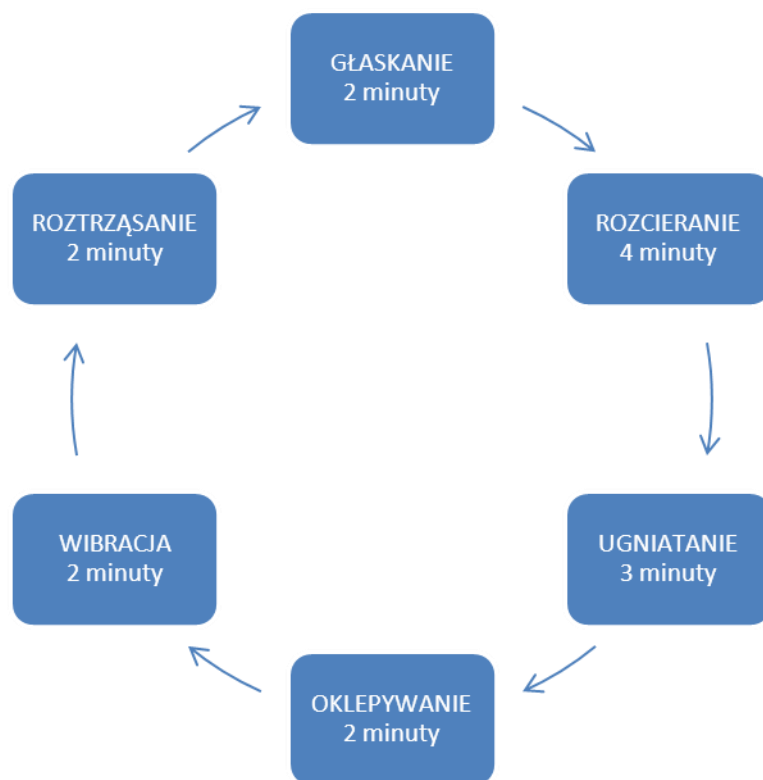


Fig. 1 A diagram showing the massage techniques [Source: own]

In both groups included the following massage around the cervical spine:

podpotyliczne muscle, the trapezius muscle (descending portion and lateral), rhomboid muscles, levator scapulae muscle. In both groups, the duration of a single procedure was 15 minutes on each side of the body. As the first mass right side of the body (7,5min.) And left (7.5 min.).

Statistical analysis was performed in STATISTICA (13 GB version).

## Results

The analysis of test results, first presented data obtained in the Questionnaire NDI.

Tab. 1 Results based on the Neck Disability Index Questionnaire.

The scope of points	DISABILITY	n = 46	%
0-4 points	lack of disability	5	10.9%
5-15 points	mild disability	35	76.1%
15-24 points	moderate disability	6	13.0%
25-34 points	severe disability	0	0%
35-50 points	extreme suffering and disability	0	0%

Legend: n- group size.

As can be seen from Tab. 1 patients were the largest group of people with mild disabilities (76.1%).

The following graph shows the mean pain intensities obtained during the evaluation of the Group I and II.

The average value of the intensity of pain, cervical spine during a diagnostic procedure in both groups was comparable, indicating the homogeneity of groups. In Group I the value of pain intensity on a scale NRS was 4.0 in Group II 4.3.

The table below presents the results of the assessment of pain intensity obtained after a series of 10 massage: aromatherapy (Group I) and classical (Group II).

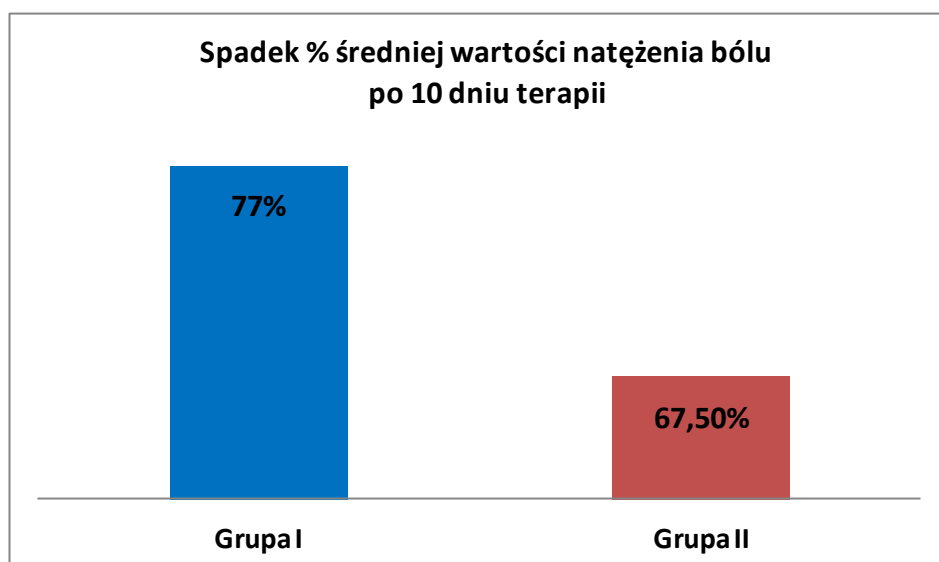


Fig. 2 percent drop in the average value of pain intensity after 10 therapeutic treatment, the NRS in Group I and II.

As is clear from Fig. 2 to a larger decline in average pain intensity occurred in patients in Group I, which was carried out in aromatherapy treatments.

Below are the results of the analysis of cardiac parameters before, after and 5 minutes after the massage in the Group II Ii after a series of 10 massage.

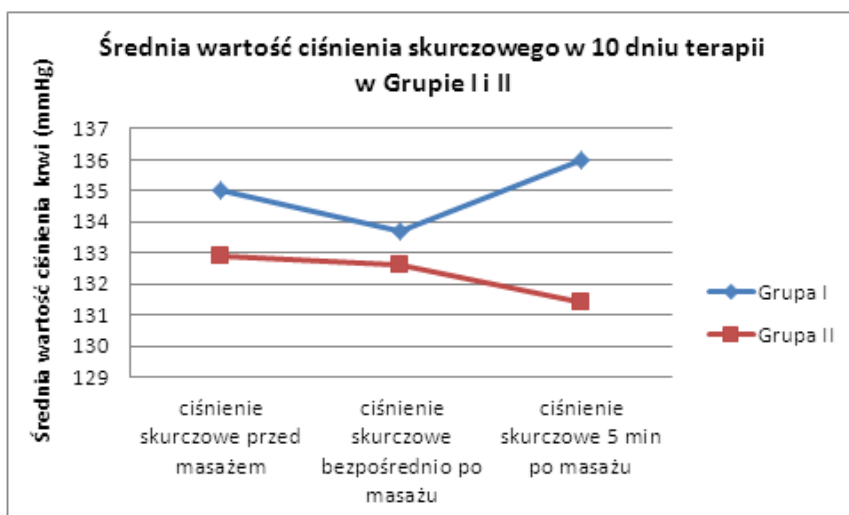


Fig. 3 Comparing the average systolic blood pressure between I and group II at day 10 of treatment.

As is apparent from Fig. 3 treatment on day 10 in both groups there was a decrease in systolic blood pressure after treatment. After 5 minutes in the group and there was an increase in systolic blood pressure drop in group II parameter (statistically significant difference - Tab. 2).

Tab. 2. The rating statistical significance on day 10 in Group I and II comparing the systolic blood pressure measured before, after and 5 minutes after the massage.

Day 10 / The test parameter	compared Group	p
Systolic blood pressure before the massage	Group I	0.15
	Group II	
Systolic blood pressure immediately after the massage	Group I	0.36
	Group II	
Systolic blood pressure five minutes after the massage	Group I	<b>&lt;0.05</b>
	Group II	

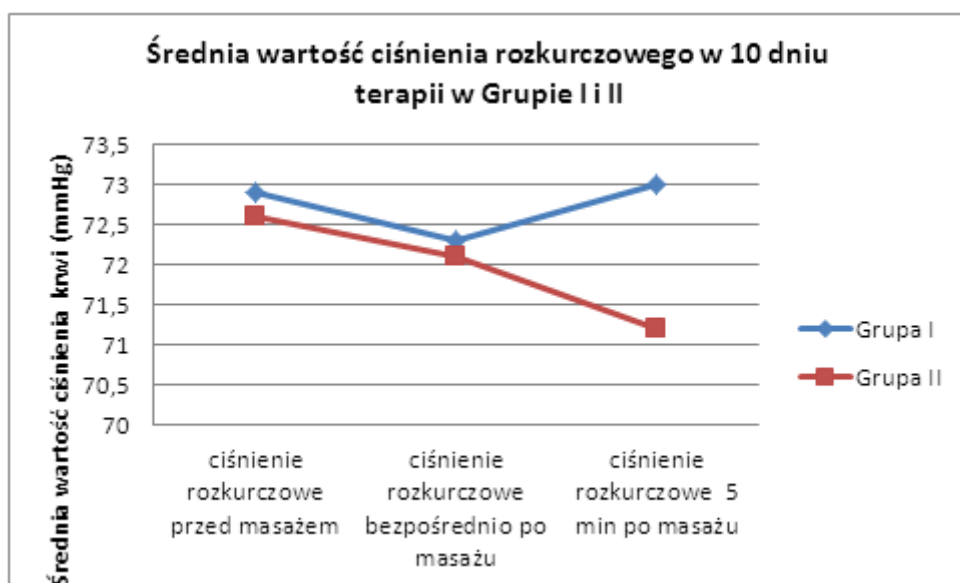


Fig. 4 Comparison of the average diastolic blood pressure between I and II group after Day 10 of treatment.

As can be seen from Fig. 4 In both groups there was a decrease in diastolic blood pressure after treatment. When measuring after 5 minutes there was an increase of the parameter in the Group I and its fall in Group II (a statistically significant difference – Tab. 3).

Tab. 3. The rating statistical significance on day 10 in Group I and II comparing the diastolic blood pressure measured before, after and 5 minutes after the massage.

Day 10 / test parameter	compared Group	p
Diastolic blood pressure before the massage	Group I	0.56
	Group II	
Diastolic blood pressure immediately after the massage	Group I	0.79
	Group II	
Diastolic blood pressure five minutes after the massage	Group I	<b>&lt;0.05</b>
	Group II	



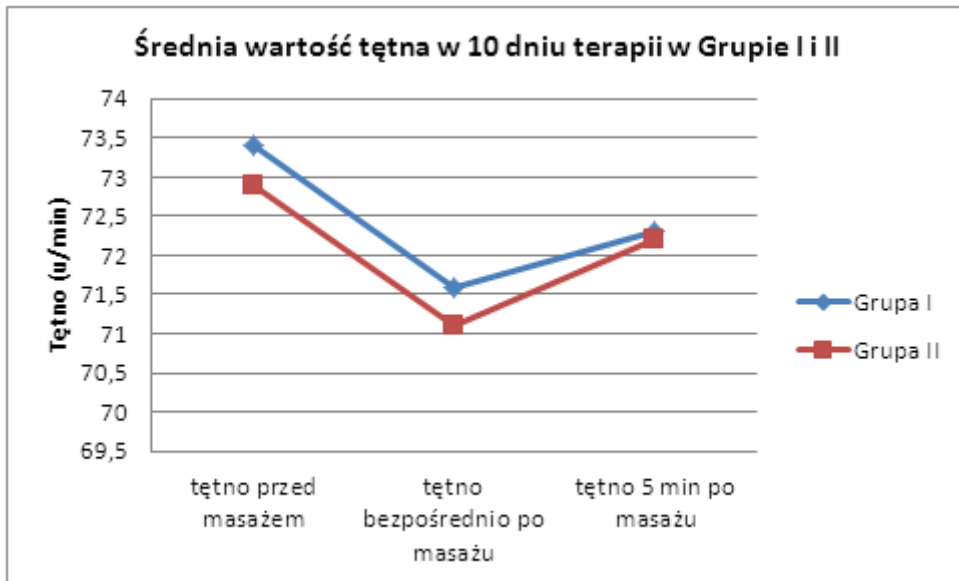


Fig. 5 Comparing the average heart rate between the first and second group at day 10 of treatment.

Fig. 5 shows a comparable drop in heart rate at day 10 of treatment in both groups after treatment. After five minutes of operation of the Group I and II there was an increase parameter. No statistically significant differences.

## Discussion

Nowadays the problem of painful cervical spine often occurs due to a variety of factors causing these problems [6,7,8]. Every year in Poland because of the pain, suffering 34 million people, including 7 million touch of a chronic pain [9]. In 43% of back pain are [1]. It is the most common reason for using the services of a physiotherapist [10].

In the scientific literature lacks works in which is described the effect of classical massage and aromatherapy for the effective reduction of the parameters pressure and heart rate and eliminate the pain in the cervical spine.

Many authors are of the opinion that one of the ways to address back pain is a therapeutic massage [11,12,13,14].

Andrzejewski et al. Concluded that massage pain in the cervical spine is an effective form of treatment. This treatment improved both comfort and quality of life of patients. There has also improve the general condition [15].

Sherman et al. They found that therapeutic massage treatment is safe and a beneficial effect for the patient and alleviates pain in the neck. Doing massage for 10 weeks, they concluded

that more effective massages tend to be long-term (10 massages at 10 weeks) for chronic pain of the cervical spine. After 10 weeks, the majority of participants NDI index significantly decreased [16]. Similar conclusions were reached Horseradish et al., Who conducted a study and concluded that massage effectively reduces the incidence of pain in the cervical spine in the short term but also reduces its intensity [17]. To interesting conclusions they were also Romaniuk et al. Their studies confirmed the effectiveness of massage in the abolition of the pain of the cervical and describe the positive effects of massage on reducing the time discomfort. Also drew attention to the increased functionality of the spine as a result of this treatment [3].

As is clear from the literature review, therapeutic massage is very effective especially in chronic pains. It happens that its effect on the symptoms of pain in the cervical spine is disputed among authors [18,19]. Ezzo et al. In their studies show similar opinions. According to the researchers therapeutic massage is an important part of physiotherapy activities, but not a decisive factor for the efficacy of therapy [20]. Topolska et al. Conclude on the adverse effects of massage. According to their study treatment did not significantly affect the reduction of the disability and does not reduce back pain [19].

In many studies, the authors pointed out that aromatherapy massage also leads to reducing pain symptoms [21,22,23]. It is also recognized as a relaxing action and reinforcement [24]. In studies Olapour et al. Has shown analgesic effect due to inhalations of lavender. Compared to placebo the authors obtained a significant decrease in pain [25]. Zdrojewicz et al. They believe that aromatherapy due to its mild action should be treated as an auxiliary therapeutic method. Also, as a kind of natural medicine can be a good option for the often harmful pharmacological analgesic [26]. Cwirla et al. have shown that aromatherapy massage has a better analgesic effect than classical massage [27].

In our study, the authors conducting research in a group of 46 people.

It led to a decline in the perception of pain after a series of aromatherapy massages by 77%, and after a series of classical massage decline was 65.5%.

Many authors have used aromatherapy as an effective therapeutic alternative. Results cited work suggests that aromatherapy is a good option complementing the basic therapy, in addition to conventional treatment [28,29].

There are studies in the literature, which did not show statistically significant results in terms of the benefits that would result from the use of aromatherapy. In studies Soden et al. Failed to show significant long-term benefits of aromatherapy and massage in improving pain control, anxiety or quality of life [29].

Data indicate the efficacy of classical massage action in lowering the parameters pressure and heart rate [30]

In our study, it was found the classical massage statistically significant ( $<0.05$ ) lower systolic and diastolic five minutes after the massage at day 10 of treatment. Analyzing the heart rate parameter is obtained between the two groups a statistically significant difference. Study the effect of a massage on the above-mentioned parameters carried Olney [31]. He said that a massage performed regularly can lead to a decrease in these parameters even in patients with hypertension [31].

Assess the impact of Swedish massage on blood pressure also they conducted Aourell et al. Found that massage has much to do with the impact on the nervous system by inhibiting the sympathetic nervous system work. They concluded that the procedure can be an effective complement to the treatment of patients with hypertension, who was called chronic stress [32]. In a similar study performed topic Holland et al., They studied the effect of a gentle massage on the back of changes in blood pressure and heart rate. They observed a reduction in pressure to the extent significant, both systolic and diastolic blood pressure [33]. Further research on the effectiveness of therapeutic massage, which effectively reduce the pressure and pulse conducted Cady et al. They concluded massage treatment efficacy in reducing stress. They evaluated on the basis of changing parameters of blood pressure. The results showed a decrease in blood pressure and systolic and diastolic blood pressure [34].

According Hernandez-Reif et al., Massage affects the gradual relaxation of muscles and can reduce blood pressure. This therapy can be effective in lowering diastolic blood pressure and the symptoms associated with hypertension [35].

There are in the literature comparing the results of several forms of massage and their impact on the parameters pressure and heart rate. Cambron et al. Undertook a study on the impact of massage / parameters in comparing together several forms of massage. They concluded that these changes depend largely on the type of surgery. Classic massage is best contributed to lowering blood pressure. Point therapy and sports massage increased systolic blood pressure. Conversely, if the two combined types of massage, both parameters were increased [36].

In the literature, there are also works in which authors conducted a study on the effects of massage on the parameters pressure and heart rate in healthy subjects. Walaszek et al. In their studies they evaluated the effect of classical massage on the parameters pressure and heart rate in healthy men. Measurements were performed in a short time after the surgery. The authors concluded that massage does not significantly change these parameters [30].

The obtained results should be working to continue expanding them to increase the

size of the group and to measure blood pressure and heart rate in a period longer than 5 minutes after the procedure. Also useful would be to use more objective ways to measure the intensity of pain that results become more efficient.

## Conclusions

1. Both types of treatments resulted in lowering blood pressure. Classical massage has achieved better results in lowering systolic and diastolic blood after 5 minutes after a 10-day massage therapy.
2. Both aromatherapy massage and classic led to a reduction in heart rate immediately because the end of the massage, however, only one day of treatment. It would extend a series of massages to note the impact of significant changes in the parameters of pulse massage.
3. Aromatherapy massage exhibits superior analgesic effect than classic massage, what to look for when selecting treatment for patients with back pain.

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