

## Original Research

# A Pilot Study on the Effect of Massage on Stress among Female Japanese University Students

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## ABSTRACT

### Aim

The majority of previous studies with medical and clinical samples shows an immediate effect of massage on reducing stress. However, there are a few such studies with non-medical and non-clinical samples. The present study examined the stress reduction effect of massage given by same sex peers among university Japanese women.

### Methods

Eleven female university students who belong to the same junior-year seminar class participated in this study. They were paired off and performed back massage each other for approximately 10-minutes as a part of class work. Their stress levels were measured using the saliva amylase monitor kit before the massage, 5, 10, and 15-minutes after the massage. Their levels of dislike of being touched were also assessed by the Touch Hesitation Scale.

### Results

Results indicated that the reduction of stress at five minutes after the massage was not statistically significant ( $Z=-1.05$ , ns), but the reduction at 10-minutes after massage was statistically significant ( $Z=-2.00$ ,  $p=0.045$ ) and at 15-minutes was marginally significant ( $Z=-1.82$ ,  $p=0.068$ ). The individual's level of dislike of being touched did not relate to any reduction in their level of stress.

### Conclusion

The results of this study suggested that casually practiced massage could contribute to women's health by reducing stress.

### Keywords

Massage; Stress reduction; University students; Japanese women.

## INTRODUCTION

The words "healing" and "soothing" are prevalent in our stressful society. In fact, infant massage, adult foot massage and body massage are very popular on a commercial basis. The reason why massages are so popular is that people feel good or get benefits from massage. The beneficial effects of massage have been shown in research as well.

Tiffany Field, a leading researcher of massage therapy and her colleagues in the Touch Research Institute, University of Miami School of Medicine, Miami, FL, USA, have conducted many studies on massage or touch and have revealed its beneficial effects in many areas. For example, in an intervention study for the

children who were referred to school counselors due to behavior problems in school after Hurricane Andrew, the children who received massage therapy showed significant reduction in their level of anxiety, depression, and stress compared to the video attention control group.<sup>1</sup> According to the review of the massage therapy research, the effect of massage therapy is promoting growth, decreasing depression and aggression, enhancing attentiveness, reducing pain, and improving immune function.<sup>2</sup>

Another leading researcher of massage/touching, Kerstin Moberg<sup>3</sup> listed the following effects of touch: lowering blood pressure, pulse rate, and level of stress hormones, promoting health, making children calmer, socially more mature, and less aggressive, and having less physical complaints. She explained that

administering massage/touch on human body induces oxytocin, which reduces stress and makes an individual calmer and more social.<sup>4</sup>

Among the studied effects of massage, reducing the level of stress is especially worthy of noting. Massage will contribute to the prevention of illness which might be caused by stress. In the next section, review literature focusing on the effects of massage/touch on stress is shown in more detail.

### Massage and Stress Reduction

There are many medical and clinical studies on the effect of massage. For example, Stringer et al<sup>5</sup> examined the safety and effect of massage among patients undertaking intensive chemotherapy. They strictly screened the patients, which led to 39 participants, then, randomly assigned them in three groups: those who received aromatherapy massage, those who received massage with basic oil, and the rest group. The massage was a single 20-minutes session. Blood samples were collected before the intervention, 10-minutes after the intervention, and every 30-minutes for two hours. The results showed significantly greater reduction of serum cortisol level in both the massage and aromatherapy massage groups than in the rest group at 30-minutes after the intervention. Beyond 30-minutes, however, there were no significant differences in three groups. Cortisol is recognized as a hormone influenced by chronic stress<sup>5</sup> therefore, the results of their study indicate that the stress level of the patients decreased after a single 20-minutes massage session, although it seems to have no long-term effects.

Another study for women with breast cancer reported similar results. In the Listing et al<sup>6</sup> study, thirty-four women who finished primary breast cancer treatment were randomly assigned to a massage therapy group or to a standard treatment control group. The intervention consisted of 30-minutes classical massage biweekly for five weeks. Six weeks after the intervention was a follow-up period. The results indicated that although there was no significant group difference in perceived stress at the end of the intervention, the massage group had significantly reduced perceived stress after the intervention, but not for the control group. At the end of the follow-up period, however, significant reduction of perceived stress from the baseline was not found.

Similarly, a randomized control study of foot massage for moderate-to-severe individuals with dementia revealed no significant group difference in physiological stress responses (blood pressure and heart rate), but the foot massage group experienced greater reduction in both blood pressure and heart rate.<sup>7</sup> A Japanese intervention study showed similar results. In this study, elderly women under long-term hospitalization were administered aromatherapy twice a week for four weeks and their stress levels were measured by salivary amylase activity, Face Scale, and General Health Questionnaire (GHQ). The results indicated marked reduction of stress after each aromatherapy session, however, the reduction over the long-term was shown only on the GHQ.<sup>8</sup> Stress reduction immediately after massage therapy but no long-term effect was also reported among hospitalized psychiatric patients. In the

forementioned study, the massage group received daily 20-minute massage for seven weeks in addition to the usual treatment and were compared to the control group who received the usual treatment only. The massage group showed a significant reduction of stress hormone level after the massage but there was no significant group difference over time.<sup>9</sup> There is also a study showing both immediate and long-term effect of massage therapy. A sample of depressed adolescent mothers were assigned to the massage therapy group and received 30-minutes massage for two consecutive days a week for five weeks, and the relaxation therapy group who did yoga exercises and muscle relaxation for the same time schedule. Only the massage group showed significant reduction of saliva cortisol after the massage session in both the first and the last days of intervention and significant reduction of the urine cortisol level over the course of the study.<sup>10</sup>

On the other hand, there are a few studies that showed no effect of massage on stress. Lindgren et al<sup>11</sup> conducted a randomized intervention study for patients scheduled for elective aortic surgery. A group of patients who received one 60-minutes massage before surgery did not differ from the control group in stress-related outcomes such as blood pressure, serum cortisol, etc. In another study of children under-going cancer treatment, the group who received weekly massage for four weeks did not differ in the levels of blood pressure and salivary cortisol from those of the control group who had quiet time with their parents.<sup>12</sup>

Thus, from the previous intervention studies of medical and clinical samples, although there are a few studies indicating no effect of massage, a majority of the studies show some immediate effect of massage for reducing stress. It seems that massage intervention has some effects on stress reduction regardless of the types of massage and the duration and frequency of its application.

For the non-medical and non-clinical samples, however, there are a few such studies. Diego et al<sup>13</sup> examined the effectiveness of massage therapy techniques by randomly assigned healthy adults to moderate massage, light massage, and vibratory stimulation groups. The participants in all conditions received 10-minutes massage by a trained massage therapist. Their stress levels were evaluated by the visual analogue stress/relaxation scale. The results indicated that moderate massage group reduced their stress level more significantly than other groups, although all groups had reduced stress levels after massage. In their review paper of massage effects, Field et al<sup>14</sup> reported the effect of massage on stress among healthcare workers, dancers, and elderly retired volunteers.

Many of those studies with non-medical/clinical samples do not employ physiological indicators of stress level, such as blood pressure, heart rate, serum or saliva cortisol level, etc. Also, in the studies reviewed above, most are intervention studies, in which massage was administered by trained therapist. Therefore, it is not clear whether the massage administered by laymen is effective on reducing stress as well. The present study examined the stress reduction effect of massage given by laymen among ordinary Japanese people.

Studies on touch reported gender difference in tactile detection sensitivity,<sup>15</sup> as well as in perception of touch and responses to touch<sup>16,17</sup> It is also reported that the effect of touch would vary depending on the age of the participants, the relationship between the person who touches and the recipient, setting that the touch happens, and intentionality of the touch,<sup>18</sup> therefore, these aspects are needed to be considered in conducting studies on the effect of massage.

## METHODS

### Participants

Eleven female university students who belong to the same junior-year seminar class participated in this study. As mentioned in the literature review, since the gender difference in tactile detection sensitivity, perception of touch and responses to touch were reported, only the data from female students who conducted massage each other were analyzed in this study.

### Materials and Procedure

**Massage:** The method of back massage was adopted from the book entitled Introduction to Tactile Care, 3<sup>rd</sup> ed.<sup>19</sup> This method of massage was developed in Sweden and has been introduced in Japan. Using both hands the massager strokes another person's back slowly and smoothly with some pressure. The movements of hands were illustrated in the book. The complete back massage lasts approximately 10-minutes.

**Touch hesitation scale<sup>20</sup>:** This scale consists of 10 items regarding abhorring touch, such as "I don't like being touched by others," "I hesitate to touch a person of opposite sex." High Reliability ( $\alpha=0.85$ ) and reasonable validity were reported. The participants responded on the 5-point Likert scale. The total score of 10 items indicates individual's degree of dislike touching and being touched.

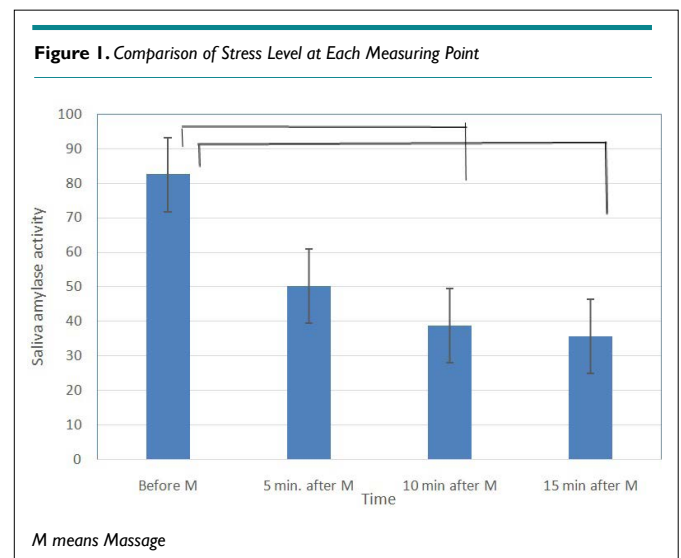
**Saliva amylase monitor kit:** This is developed and manufactured by Nipro Inc, FL, USA, as a tool for measure stress level easily. With this kit, adults can measure their stress level by themselves. Saliva amylase activity increase when mental stress is high.<sup>21</sup> We used it to measure the participants' mental stress level.

**Procedure:** Since student age, relationship between a massager and a recipient, setting, and intentionality would influence on the effect of touch,<sup>18</sup> each massage was conducted between classmates of their own choice and as a part of classwork. The participants were paired and practiced the method of back massage each other in the seminar class. They also learned how to measure their own stress level using the Saliva Amylase Monitor and answered the Touch Hesitation Scale. In the next class a week later, all the participants measured their stress level before starting massage. Then, they paired off and one member of the pair administered the back massage to the partner. Five, ten, and fifteen minutes after the massage, the person who received the massage measured their stress level using the saliva amylase monitor kit. Finishing this process, they changed the role of giving massage and went through the

same procedure.

## RESULTS

Due to the small sample size, nonparametric analyses were conducted to detect the differences and correlations. Figure 1 shows the means of stress level measured by saliva amylase before, and 5, 10, and 15-minutes after the massage and Table 1 shows more detailed description of figures at each measuring time. As shown in Figure 1, the average stress level decreased after massage. To examine whether the reductions were statistically significant or not, Wilcoxon signed rank tests with Hodges-Lehman were conducted. The results indicated that the reduction at five minutes after the massage was not statistically significant ( $Z=-0.85$ , ns), but the reductions at 10-minutes after the massage was significant ( $Z=-2.00$ ,  $p=0.045$ ), and at 15-minutes after the massage, it was marginally significant ( $Z=-1.82$ ,  $p=0.068$ ).



**Table 1. Means, SDs, and Range of Stress Level at each Measuring Point**

	n	Mean	SD	Range
Before massage	11	82.55	67.42	18~231
5 min. after	11	50.27	33.09	12~126
10 min. after	11	38.73	28.30	12~110
15 min. after	11	35.64	14.85	15~ 69

Spearman's rank order correlations between the scores of the Touch Hesitation Scale and the level of stress before massage, 5, 10 and 15-minutes after massage were performed. To examine whether the level of touch hesitation relates to the level of stress reduction at each time after the massage, the same correlation analyses were conducted between the touch hesitation score and the stress reduction score (the level of stress before massage-the level of stress at each time after massage). As shown in Table 2, none of the correlations were statistically significant.

**Table 2.** Correlation Coefficients Between the Scores of Touch Hesitation and Stress Level

	Touch Hesitation
Stress before massage	-0.012
Stress at 5 min. after massage	-0.116
Stress at 10 min. after massage	-0.390
Stress at 15 min. after massage	0.214
Stress reduction at 5 min. after massage	-0.006
Stress reduction at 10 min. after massage	0.262
Stress reduction at 15 min. after massage	-0.024

## DISCUSSION AND CONCLUSION

The present study examined the effect of massage on stress in the situation when ordinary young female adults give and receive massages. The results of the present study indicate the immediate effect of stress reduction after massage. In addition, the results revealed that the level of stress reduction did not relate with individual's degree of like/dislike touching and being touched. These results are consistent with previous studies with medical and clinical samples.

Although individual stress level decreased 5-minutes after the massage, it was not a significant reduction. However, at 10 and 15-minutes after the massage the reduction of stress is evident. This may suggest that it would take more than 5-minutes that the effect of massage appears physiologically.

There are several limitation in this pilot study. First, the sample size is very small and no control group. Secondly, half of the participants received massage right after they administer it. Therefore, the effect of administrating massage may be included in the effect of receiving massage. For the future study, with more non-medical/clinical sample having a randomized control group, the present procedure should be changed as conducting massage and measurement for the partner in a different day. Also, it would be desirable to have more physiological indicators of stress reduction as well as other self-report measurements.

Despite of the above limitations, the result of this pilot study demonstrated that the immediate effect of massage on stress reduction has an important implication in our stressful society. Massage is a cost-effective practice to contribute to individual health by reducing stress, since massage is easy to perform and it does not cost at all when ordinary people massage each other like done in this study. As mentioned in the literature review,<sup>3</sup> it stated that massage has positive effects not only on stress but also on anxiety, aggression, and making people more social. Therefore, casually practiced massage has great potential to promote healthy society.

The results of this study suggested that casually practiced massage could contribute to women's health by reducing stress.

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