

R E S E A R C H

Massage Efficacy Beliefs for Muscle Recovery from a Running Race

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Background: Belief in efficacy of CAM therapies has been sparsely reported and may be different than reported use of the therapy.

Purpose: The aim of this study was to identify efficacy beliefs of massage for muscle recovery following a 10-km running race.

Setting: Finish zone of a 10-km race.

Research Design: Participants completed a brief survey regarding running race characteristics, prior use of massage, and belief in efficacy of massage regarding muscle recovery from the race.

Participants: The subject pool consisted of 745 individuals who completed a running race and were within 60 minutes of race completion.

Main Outcome Measures: Subjects reported demographic information (age, gender), race information (finish time, perceived exertion, muscle soreness, fatigue), prior use of massage, and belief regarding efficacy of massage for postrace muscle recovery.

Results: Most study participants believed that massage would benefit muscle recovery following the running race (80.0%), even though only 43.9% had received a massage previously. Those who had received at least one massage were significantly more likely to believe that massage would benefit muscle recovery (91.9% vs. 70.4%, $p < .001$). Females were more likely than males to have had a massage (52.3% vs. 36.0%, $p < .001$) and to believe it would benefit recovery (83.1% vs. 77.1%, $p = .046$).

Conclusions: Massage is well-accepted as a muscle recovery aid following a running race, but females and those who have used massage were significantly more likely to perceive it as advantageous. Belief in a therapeutic value of massage for muscle recovery exceeds its reported use.

KEY WORDS: treatment efficacy; complementary medicine; integrative medicine; physical activity; recovery of function

INTRODUCTION

Several large-scale surveys have been conducted in recent years to identify use and trends in

complementary and alternative medicine (CAM) among the general population.^(1,2) In the most recent survey, which involved 23,393 adults and 9,417 children, nearly 40% of adults and 11.8% of children had used a CAM therapy in the previous 12 months; use of acupuncture, massage therapy, and naturopathy were found to be increasing in use from a comparable earlier report.⁽¹⁾ Characterization of CAM use by specific regional populations,⁽³⁻⁵⁾ for disease states,⁽⁶⁻⁹⁾ or to describe its acceptance among medical practitioners^(10,11) also supports the popularity of CAM therapies.

The above broad-based studies are not designed to identify efficacy beliefs for CAM in general or for a specific therapy, and may misrepresent the actual acceptance of a therapy. Furthermore, little research has been conducted to understand efficacy beliefs for those who have not used a CAM therapy. While, it is tempting to assign support for a CAM therapy to those who have used it, research supporting this connection is lacking. A distinction between use of and belief in a therapy is important, since acceptance for and adherence to treatment are positively linked.^(12,13)

Massage therapy is a CAM modality that is increasing in popularity and, together with chiropractic care, accounts for half of all visits to practitioners of alternative therapies.⁽²⁾ It is also popular for specific health concerns as it is cited as a commonly sought therapy for back or neck pain, headache, and anxiety or depression.^(7,10) While many individuals ascribe massage to improvement in health, others may not elect massage for a variety of reasons, among them a reservation regarding benefit, cost, ability to locate a therapist, apprehension towards touch, or time commitment.⁽¹⁴⁾ It is helpful to characterize beliefs regarding CAM treatments because attitudes derive from direct and indirect experiences; negative experiences in the formation of early beliefs regarding efficacy may unduly bias one against treatment avenues.

The present study was conducted to determine the efficacy beliefs of massage for muscle recovery following completion of a 10-km running race. Characterization between those who have belief in massage and those who don't is reported in terms of gender, prior massage use, and age.

METHODS

The Institutional Review Board at the Boulder College of Massage Therapy approved the procedures for this study.

Study Population and Survey Instrument

The study population was obtained from finishers of a 10-km running race. Subjects were recruited immediately following race completion while in the race finish area of the event. Race participants were approached by study personnel and queried for interest in participating in a research study. Individuals agreeing to participate were asked to complete a short questionnaire and return it to study personnel. Using open-ended questions, subjects recorded their gender, age, race finish time, time since they finished the race, number of professional massages received, and quantity of sleep from the previous night. For the question, “Do you think massage would be beneficial for your muscle recovery from today’s race,” subjects were provided with “Yes,” “No,” or “Unsure” options. For statistical analysis, responses of ‘no’ or ‘unsure’ were grouped. Subjects were not specifically asked about prior experience with CAM therapies. Hours slept were recoded as a control variable to ensure sleep-related fatigue did not influence perception of massage differently across groups. A 0–10 numerical scale was provided for questions concerning race variables (perceived exertion, fatigue, muscle soreness), where 0 indicated a lack of the particular variable (e.g. fatigue anchored with “No fatigue”) and 10 indicated maximum (e.g. fatigue anchored with “Extreme fatigue”). All responses were voluntary and anonymous. Questionnaires were immediately returned to a study volunteer. A total of 745 subjects participated in the study; it was not possible to track refusal rates, but participation was well-received.

Statistical Analysis

Continuous data are presented as the mean \pm standard deviation. Unpaired *t* tests were used to assess group differences among the variables age, finish time, time since finish, perceived exertion, muscle fatigue, muscle soreness, and quantity of sleep. Chi-square goodness of fit analyses were conducted to assess the associations of gender with perceived benefit on muscle recovery from massage and prior massage use, and between perceived benefit of muscle recovery and prior massage use. The a priori alpha level was set at 0.05. Statistical analyses were determined using SPSS software (IBM SPSS Statistics, Version 19).

RESULTS

Characterization of Study Participants

The mean subject age was 36.8 ± 12.0 years with a race time of 57.5 ± 16.9 minutes and a perceived

exertion of 7.6 ± 1.6 (Table 1). Subjects reported moderate levels of muscle fatigue (5.2 ± 2.2) and soreness (4.2 ± 2.4). Gender differences were apparent in several race measures, with females reporting a younger age, a longer race finish time, and lower perceived exertion, muscle fatigue, and muscle soreness than males ($p = .006$ or less, Table 1). Study subjects were characterized based on having received a professional massage (Table 1). Those who reported having had massage were older (38.7 vs. 35.2 , $p < .001$), but did not differ statistically on race variables. Data were next compared based on belief of whether massage would be beneficial to race recovery (Table 1). Those who believed that massage would be beneficial to muscle recovery were older and also reported greater perceived exertion, muscle fatigue, and muscle soreness ($p = .01$ or less), but not a different race finish time ($p = .563$).

Massage Experience and Beliefs

When addressed as a whole, most study participants believed that massage would benefit muscle recovery following the running race (80.0%), even though only 43.9% had received a massage previously (Figure 1). Females were significantly more likely to believe that massage would be effective as a recovery intervention from the running race (83.1% vs. 71.1%, $\chi^2(1, 705) = 3.99$, $p = .046$). More than half of females reported a previous massage (52.3%), which was significantly greater than for males (36.0%, $\chi^2(1, 713) = 19.2$, $p < 0.001$, Figure 1).

A cross-sectional comparison across six decades noted an effect of age on having received massage and belief in its benefit (Figure 2). This age effect was consistent across gender. The age group driving the effect was the younger populations. Only 16% of respondents aged 10–19 reported having had a massage, which significantly increased to 38.9% for those in their 20s ($p < .001$). Statistically nonsignificant increases were noted after the 20–29 age range. The percentage who reported having received massage approached 50% for those between the ages 30–39, and remained at approximately that level for all other age ranges. While race participants generally believed that massage would benefit muscle recovery following the race, the belief increased considerably, from 46.9% to 77.3% ($p < .001$), between the age ranges of 10–19 and 20–29 (Figure 2). Belief in efficacy of massage increased through later decades and peaked at the 60+ age group at 88.9%, but differences were not statistically significant.

Race participants who have previously received massage were significantly more inclined to believe it would be beneficial than those who had not had a prior massage (Figure 3, $p < .001$). Stated differently, those who previously received massage were more likely, by greater than a 10:1 ratio (91.9% vs. 8.1%), to think that massage would be beneficial toward

TABLE 1. Race Characteristics of All Participants and Groups

	All Participants		Gender		Prior Massage		Is Massage Beneficial to Recovery?	
	N	Mean±SD	Male (N=375)	Female (N=346)	Yes (321)	No (N=400)	Yes (N=581)	No/Unsure (N=146)
Age (y)	741	36.8±12.0	38.0±11.9	35.0±11.7	38.7±11.5	35.2±12.2	37.6±11.6	39.4±12.4
Race Time (m)	678	57.5±16.9	52.1±14.5	63.8±17.1	58.2±17.6	57.0±16.2	57.8±17.1	56.9±16.4
Time Since Race Finish (m)	651	37.9±30.2	33.5±28.6	42.7±30.7	36.0±30.3	39.5±30.0	37.6±29.7	39.4±32.6
Perceived Exertion	741	7.6±1.6	7.9±1.6	7.3±1.59	7.6±1.7	7.6±1.6	7.7±1.6	7.4±1.5
Muscle Fatigue	739	5.2±2.2	5.4±2.1	5.0±2.3	5.3±2.2	5.1±2.2	5.4±2.1	4.5±2.4
Muscle Soreness	742	4.2±2.4	4.4±2.4	4.0±2.4	4.4±2.3	4.1±2.4	4.4±2.3	3.6±2.5
Quantity of Sleep (h)	724	6.2±1.3	6.1±1.3	6.3±1.3	6.2±1.3	6.2±1.3	6.2±1.2	6.2±1.5
					p-value		p-value	p-value
					0.001		<0.001	<0.001
					<0.001		0.334	0.563
					<0.001		0.148	0.532
					<0.001		0.959	0.021
					<0.001		0.331	<0.001
					0.006		0.131	<0.001
					0.011		0.595	0.943

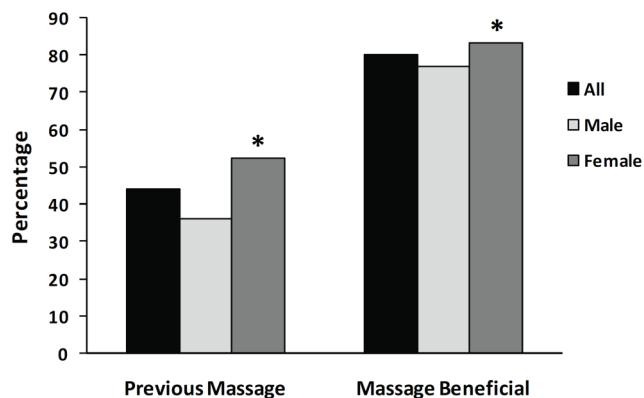


FIGURE 1. Percentage of subjects who have received massage and perceive that massage would be beneficial to post-race muscle recovery by gender. An asterisk (*) indicates a significant difference from the corresponding assessment for males.

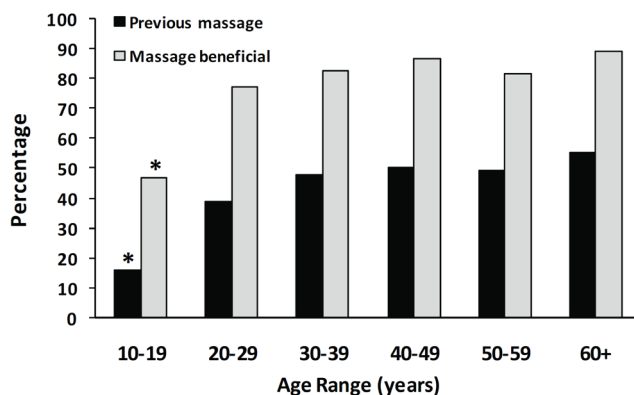


FIGURE 2. Percentage of subjects who have received massage and perceive that massage would be beneficial to post-race muscle recovery by age. An asterisk (*) indicates a significant difference from respective group assessment for other ages.

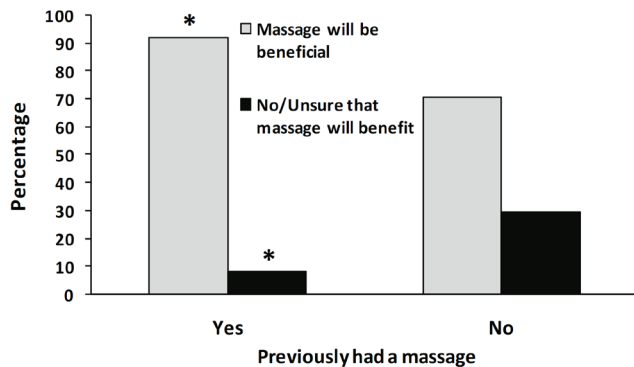


FIGURE 3. Percentage of subjects indicating beliefs in massage for post-race muscle recovery based on prior massage use. An asterisk (*) indicates a significant difference from like category for those indicating they had not had a prior massage.

muscle recovery. In contrast, for those who had never received massage, the ratio of those who perceived massage to be beneficial to those doubtful was 2.4:1 (70.4% vs. 29.6%).

DISCUSSION

In the present study, we found that massage is well-accepted as a valuable recovery intervention from a running race. Females were more likely to have had a massage. Those who reported prior massage use were more likely to also report greater race-associated muscle soreness or fatigue, and believe in the efficacy of massage for muscle recovery.

The concept that massage is a treatment technique to address muscle recovery is intuitive to most people and this study likely represents a higher end belief of massage efficacy (91.9% of prior users, 70.4% of prior nonusers). However, in one study, 93% of survey respondents perceived massage to be effective for their respective health ailment.⁽¹⁵⁾ The belief that massage may benefit nonmuscle-based health concerns is also quite high. In a study on adolescents with asthma, 76% of individuals who had used massage, perceived it to be helpful for reducing asthma symptoms, whereas 60% of individuals with little or no prior CAM use would consider massage for management of their asthma symptoms.⁽¹⁶⁾ Individuals who regularly use CAM therapies tend to be more health-conscious.^(17,18) Those who do not use CAM therapies but are open to change and committed to maintaining their health have been found to be more receptive to CAM therapies—populations likely present in the study sample.⁽¹⁹⁾ Consequently, CAM investigations that are biased for or against individuals with prior CAM use may yield different responses or results than if drawn from a randomized population.

Prior research has identified four themes that reflect a consumer's CAM-use experience: interpersonal (eg, interaction with practitioner), physical (eg, sensation of touch or pain), affective (eg, emotional aspects), and cognitive.⁽¹⁴⁾ Those who express positive evaluations of at least one of the four dimensions are more likely to maintain CAM treatment. The interpersonal dimension is particularly important in the earlier treatment stages, and is an attribute common to massage where the individualized attention is perceived during a massage treatment session. As an extension of the four themes, for individuals who had a prior massage, the above dimensions could become held beliefs leading to a greater acceptance in the efficacy of massage.

In keeping with use trends noted elsewhere,^(8,20) females in the present study were more likely than males to have received a massage. They were also more likely to believe in its efficacy. Similarly, as one ages, support regarding use and efficacy beliefs of CAM therapies increases,⁽²¹⁾ a result mirrored in the

present study. Our data (not presented) also indicated that the single greatest rate increase in massage use occurs during the 20s for women, but not until the 30s for males. Gender differences were noted on all race-associated variables, which was not unexpected due to the physical effort put forth during the race. However, when study subjects were compared based on prior massage experience, only age was significantly different, with those noting prior massage use being older. Younger individuals (ages 10–19) were less likely to have received massage and more likely to be uncertain of a benefit, which is the primary contributor to the age difference.

Demographic variables from individuals encompassing a nationally representative population have been obtained on use of 23 CAM modalities, including massage.⁽²⁰⁾ That national survey found 20.3% of respondents had a lifetime incidence of massage use, a value much lower than the 43.9% from the present study even though the percentage of male and female respondents was similar. The regional and event-specific population could account for some of that discrepancy.

Race participants who believed that massage would be beneficial to muscle recovery also had higher self-report scores for race variables associated with greater physical effort including perceived exertion, muscle fatigue, and muscle soreness. One interpretation of this finding is that a threshold exists where the concept of massage becomes more appealing when fatigue or muscle soreness reaches that level, thus eliciting a response indicative of a beneficial effect from massage. Similarly, the lack of reported muscle-related issues could indicate that little recovery was believed to be needed and, therefore, massage would provide little additional gain. The present findings suggest physiological differences (eg, physical fitness, pain threshold, etc.) among individuals could contribute to their decision to elect massage. Further investigation into differences between consumers and nonconsumers is needed.

Several limitations to the study should be noted. First, data for this study were collected from subjects within one hour post-race, when fatigue and perhaps soreness were likely near their peak. Discussion of massage with an individual at this point could be more appealing than if held when the individual was fully rested, which would have the effect of increasing support for massage. Data collection prior to the race or when fully rested could yield differing findings since muscle pain would not be a factor in the response. Second, the study employed a cross-sectional design to assess age-associated use and beliefs in massage. Inherent to cross-sectional study designs are fluctuations in data due to the lack of subject continuity, which can result in aberrations of the data across age intervals. Lastly, subjects were only asked whether they had received a massage previously and not whether it was self-initiated, thus potentially biasing

the ‘prior massage’ analysis group with individuals who received massage per medical necessity rather than self-volition.

CONCLUSION

Use of CAM therapies has been on an upward trend in recent years, but an understanding of the believed efficacy by consumers, as well as nonconsumers, of specific CAM therapies is lacking. An understanding of patient beliefs toward a treatment modality is beneficial for ensuring treatment or research plan adherence. Specifically, practitioners may have a more difficult time convincing males and those who have not previously had a massage that massage could be beneficial to their health concern.

The belief that massage therapy would aide recovery from the physical effort of a running race was supported by nearly 80% of respondents, yet only 43.9% indicated they had previously received massage, suggesting that belief in a therapeutic value of massage is greater than its use. Prior experience with massage was also a strong indicator of belief in its efficacy, with 91.9% of prior massage users believing that massage would aid postrace muscle recovery.

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CONFLICT OF INTEREST NOTIFICATION

The author declares there are no conflicts of interest.

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