

Table 1. Characteristics of the included studies on the effects of pre-rolling.

Author and year	Subjects (male/female)	FR intervention	Targeted muscles/region	Time between FR and post-test	Outcome measures	Effects
<i>Sprint Performance</i>						<i>Weighted overall: + 0.7% (g = 0.28)</i>
Healey et al., 2014	26 (13/13) Healthy and recreationally active	1 x 30 s each muscle Foam roller Body weight	Quadriceps, hamstrings, iliotibial band, calves, latissimus dorsi, and rhomboid muscles	0 min	Pro-agility test	Post 0 min: + 0.2% (g = 0.02)
Mikesky et al., 2002	30 (7/23) National Collegiate Athletic Association Division II soccer, basketball, and volleyball athletes	A total of 2 min Roller massager	Gluteals, hamstrings, quadriceps, and calf muscles	0 min	Flying-start 20-yard dash	Post 0 min: + 0.7% (g = 0.66)
Peacock et al., 2014	11 (11/0) Healthy, athletic, and physically active	1 x 30 s each region Foam roller Body weight	Thoracic/lumbar, gluteal, hamstring, calf, quadriceps/flexor, and pectoral regions	0 min	18.3-m pro agility test 37-m sprint test	Post 0 min: + 3.3% (g = 0.70)
Phillips et al., 2018	24 (8/16) Healthy and physically active	1 x 5 min each muscle Foam roller Body weight	Quadriceps and triceps surae muscle groups	0 min	Pro-agility test	Post 0 min: - 0.7% (g = -0.09)
<i>Jump Performance</i>						<i>Weighted overall: - 1.9% (g = 0.09)</i>
Grabow et al., (2017)	16 (8/8) Healthy and either resistance and/or aerobically physically trained	3 x 60 s Roller massager 90 % of the participants maximum rating of perceived pain	Quadriceps muscles	0 min 10 min	Vertical single-leg drop jump test	Post 0 min: - 3.0% (g = -0.02) Post 10 min: + 1.8% (g = 0.01)
Healey et al., 2014	26 (13/13) Healthy and recreationally active	1 x 30 s each muscle Foam roller Body weight	Quadriceps, hamstrings, iliotibial band, calves, latissimus dorsi, and rhomboid muscles	0 min	Vertical counter-movement jump test	Post 0 min: + 2.5% (g = 0.16)
Jones et al., (2015)	20 (20/0) Healthy and recreationally active	1 x 30 s each muscle Foam roller Body weight	Gastrocnemii, quadriceps, hamstrings, and glutei muscles	0 min	Vertical jump test	Post 0 min: - 0.3% (g = -0.02)

Table 1. Continued.

Author and year	Subjects (male/female)	FR intervention	Targeted muscles/region	Time between FR and post-test	Outcome measures	Effects
Mikesky et al., 2002	30 (7/23) National Collegiate Athletic Association Division II soccer, basketball, and volleyball athletes	A total of 2 min Roller massager	Gluteals, hamstrings, quadriceps, and calf muscles	0 min	Vertical counter-movement jump test	Post 0 min: + 1.0% (g = 0.36)
Peacock et al., 2014	11 (11/0) Healthy, athletic, and physically active	1 x 30 s each region Foam roller Body weight	Thoracic/lumbar, gluteal, hamstring, calf, quadriceps/flexor, and pectoral regions	0 min	Vertical counter-movement jump test Standing long jump test	Post 0 min: + 4.9% (g = 0.43)
Phillips et al., 2018	24 (8/16) Healthy and physically active	1 x 5 min each muscle Foam roller Body weight	Quadriceps and triceps surae muscle groups	0 min	Vertical counter-movement jump test	Post 0 min: - 2.6% (g = -0.13)
Sagiroglu et al., 2017	16 (16/0) Well-trained combat athletes, who were competing in Judo, Karate, Tae Kwon Do, and Muay Thai	2 x 30 s each muscle Foam roller Body weight	Hamstrings, quadriceps, hip, and gastrocnemius muscles	0 min 5 min 10 min 15 min 30 min	Vertical counter-movement jump test	Post 0 min: - 4.2% (g = -0.50) Post 5 min: - 3.7% (g = -0.44) Post 10 min: - 0.2% (g = -0.03) Post 15 min: - 0.5% (g = -0.06) Post 30 min: - 1.1% (g = -0.14)
<i>Strength Performance</i>						<i>Weighted Overall: + 1.8% (g = 0.12)</i>
Cavanaugh et al., 2017	12 (12/0) Healthy and recreationally active	3 x 30 s Roller massager 7 on a visual analog pain scale of 1 to 10	Gastrocnemius muscle	0 min 5 min	Maximum isometric voluntary force of the plantar flexors	Post 0 min: - 0.8% (g = -0.04) Post 5 min: - 3.6% (g = -0.19)
Grabow et al., 2017	16 (8/8) Healthy and either resistance and/or aerobically physically trained	3 x 60 s Roller massager 90% of the participants maximum rating of perceived pain	Quadriceps muscles	0 min 10 min	Maximum isometric voluntary force of the knee extensors and knee flexors	Post 0 min: - 4.7% (g = -0.04) Post 10 min: + 2.8% (g = 0.04)

Table 1. Continued.

Author and year	Subjects (male/female)	FR intervention	Targeted muscles/region	Time between FR and post-test	Outcome measures	Effects
Healey et al., 2014	26 (13/13) Healthy and recreationally active	1 x 30 s each muscle Foam roller Body weight	Quadriceps, hamstrings, iliotibial band, calves, latissimus dorsi, and rhomboid muscles	0 min	Maximum isometric voluntary quarter squat force	Post 0 min: + 3.9% ($g = 0.13$)
MacDonald et al., 2013	11 (11/0) Healthy, recreationally active, and resistance trained	2 x 1 min Foam roller Body weight	Quadriceps muscles	0 min 10 min	Maximum isometric voluntary force of the knee extensors	Post 0 min: + 11.5% ($g = 0.87$) Post 10 min: + 7.0% ($g = 0.55$)
Mikesky et al., 2002	30 (7/23) National Collegiate Athletic Association Division II soccer, basketball, and volleyball athletes	A total of 2 min Roller massager	Gluteals, hamstrings, quadriceps, and calf muscles	0 min	Maximum isokinetic voluntary concentric force of the knee extensors	Post 0 min: + 0.3% ($g = 0.11$)
Peacock et al., 2014	11 (11/0) Healthy, athletic, and physically active	1 x 30 s each region Foam roller Body weight	Thoracic/lumbar, gluteal, hamstring, calf, quadriceps/flexor, and pectoral regions	0 min	Indirect 1RM bench press	Post 0 min: + 3.8% ($g = 0.18$)
Sullivan et al., 2013	17 (7/10) Healthy and recreationally active	2 x 10 s Roller massager 13 kg using a constant pressure roller apparatus	Hamstring muscles	0 min	Maximum isometric voluntary force of the knee flexors	Post 0 min: 0.0% ($g = 0.00$)
<i>Overall Performance</i>						<i>Weighted overall: + 1.5% ($g = 0.20$)</i>
<i>Flexibility</i>						<i>Weighted overall: + 4.0% ($g = 0.34$)</i>
Bushell et al., 2015	31 (19/12) Healthy and competitive or recreational athletes	3 x 1 min Foam roller Body weight	Quadriceps muscles	0 min	Hip joint range of motion	Post 0 min: + 1.2% ($g = 0.33$)
Cheatham et al., 2017	45 (27/18) Healthy and recreationally active	1 x 2 min Foam roller	Quadriceps muscles	0 min	Knee joint range of motion	Post 0 min: + 2.9% ($g = 0.37$)

Table 1. Continued.

Author and year	Subjects (male/female)	FR intervention	Targeted muscles/region	Time between FR and post-test	Outcome measures	Effects
Grabow et al., 2017	16 (8/8) Healthy and either resistance and/or aerobically physically trained	3 x 60 s Roller massager 90 % of the participants maximum rating of perceived pain	Quadriceps muscles	0 min 10 min	Knee joint range of motion	Post 0 min: + 1.9% (g = 0.15) Post 10 min: + 2.9% (g = 0.22)
Griefahn et al., 2017	38 (25/13) Healthy and physically active	3 x 30 s each muscle Foam roller Body weight	Gluteus maximus, erector spinae, and latissimus dorsi muscles	0 min	Modified schober test	Post 0 min: + 0.2% (g = 0.01)
MacDonald et al., 2013	11 (11/0) Healthy, recreationally active, and resistance trained	2 x 1 min Foam roller Body weight	Quadriceps muscle	0 min 10 min	Knee joint range of motion	Post 0 min: + 11.5% (g = 0.87) Post 10 min: + 7.0% (g = 0.55)
Mikesky et al., 2002	30 (7/23) National Collegiate Athletic Association Division II soccer, basketball, and volleyball athletes	A total of 2 min Roller massager	Gluteals, hamstrings, quadriceps, and calf muscles	0 min	Hamstring flexibility	Post 0 min: + 1.1% (g = 0.49=)
Murray et al., 2016	12 (12/0) Squash players from an elite	1 x 60 s Foam roller Body weight	Quadriceps muscle	0 min 5 min 10 min 15 min 30 min	Hip flexor and quadriceps flexibility	Post 0 min: + 0.4% (g = 0.05) Post 5 min: + 1.4% (g = 0.14) Post 10 min: + 1.4% (g = 0.13) Post 15 min: + 1.8% (g = 0.22) Post 30 min: - 1.1 % (g = -0.13)
Peacock et al., 2014	11 (11/0) Healthy, athletic, and physically active	1 x 30 s each region Foam roller Body weight	Thoracic/lumbar, gluteal, hamstring, calf, quadriceps/flexor, and pectoral regions	0 min	Sit-and-reach test	Post 0 min: + 0.4% (g = 0.02)
Phillips et al., 2018	24 (8/16) Healthy and physically active	1 x 5 min each muscle Foam roller Body weight	Quadriceps and triceps surae muscle groups	0 min	Knee joint range of motion	Post 0 min: + 19.2% (g = 0.82)

Table 1. Continued.

Author and year	Subjects (male/female)	FR intervention	Targeted muscles/region	Time between FR and post-test	Outcome measures	Effects
Sagiroglu et al., 2017	16 (16/0) Well-trained combat athletes, who were competing in Judo, Karate, Tae Kwon Do, and Muay Thai	2 x 30 s each muscle Foam roller Body weight	Hamstrings, quadriceps, hip, and gastrocnemius muscles	0 min 5 min 10 min 15 min 30 min	Sit-and-reach test	Post 0 min: + 5.8% (g = 0.10) Post 5 min: + 3.6% (g = 0.07) Post 10 min: + 0.2% (g = 0.02) Post 15 min: - 3.7% (g = -0.04) Post 30 min: - 11.5% (g = -0.17)

FR, foam rolling; 1RM, one repetition maximum.