

Appendix E: Scoping review results: Non-pharmacological approaches to pain management

A total of 146 SRs were included in the scoping review (165–310). The SRs included study designs that were predominantly RCTs and some NRSs. The SRs each included between 3 to 2,115 primary studies conducted globally, most commonly in North America and Western Europe. The NPIs were delivered in hospital settings (in-patient units or clinics) and in the community (primary care, home or long-term care). Twenty-six reviews focused on the pediatric population (i.e., 0–18 years of age) (175,177,178,181,191,193–195,197,201,205,211,213,230,231,236,244,245,261,276,277,281,287,293,295,310), 116 reviews were focused on adults (i.e., 18–64 years) (165–172,174,176,179,180,182–184,186–190,192,196,198–200,202–204,206–210,212,214–218,220–229,232–235,237–243,246–252,254–260,262–275,278–280,282–286,288–292,294,296–309) and only four reviews focused on older adults living in congregate settings (i.e., >60 years of age) (173,185,219,253). Some reviews that included children and adolescents also included studies conducted in adult populations, depending on the context of the review (168,179,271,275,279). Across the included reviews, NPIs were delivered for a variety of pain experiences including acute pain (i.e., pain associated with specific medical conditions, surgical post-operative pain and pain associated with medical tests and procedures), chronic pain, neuropathic pain and nociceptive pain.

A range of physical NPIs (165–167,170,171,174,179,180,182,183,185–187,190,196,200,202–204,207,214,215,218,220,222,223,225,226,229,232–235,239,241–243,246,248–250,254,256,258–260,262,266–268,272,274,278,282,285,286,288,289,291,292,294,296,298,299,302,304,308), two occupational therapy interventions (210,247) and a wide range of psychological non-pharmacologic interventions (168,178,181,191,192,195,197–199,201,205,206,208,212,216,224,227,230,231,236,237,244,245,261,270,271,277,280,281,283,287,293,295,309,310) were delivered across the 146 SRs. Physical NPI strategies included exercise, aerobic conditions, strength and balance training, aqua therapy and breathing exercises (165,171,174,179,180,183,186,187,196,200,202,204,214,215,220,225,229,239,241,242,246,248,249,256,260,266–268,278,282,285,288,290–292,294,297,302) and some included an element of education and self-management. Physical NPIs were delivered alone or in conjunction with pharmacologic pain management strategies. Psychological strategies included the use of cognitive behavioural therapy, acceptance and commitment therapy and various approaches that featured distraction techniques and other psychological interventions (168,178,181,191,192,195,197–199,201,205,206,208,212,216,224,227,230,231,236,237,244,245,261,270,271,277,280,281,283,287,293,295,309,310). Additional psychological interventions included comforting interventions such as music therapy, breastfeeding, kangaroo care or animal-assisted interventions (175,181,193,194,211,213,219,224,227,238,240,251,269,273,275,279,300,305). Refer to **Table 15** for further details.

Table 15: Number of systematic reviews focused on non-pharmacological approaches (NPI) to pain management: Type of NPI and population

	POPULATION			
Non-pharmacological intervention	Children & adolescents	Adults	Older adults	Total number of systematic reviews
Physical therapy		66	1	67
Occupational therapy		2		2
Psychological	18	17		35
Other psychological NPIs (e.g., music, music therapy/music medicine, animal-assisted therapy, comfort [breastfeeding, sucrose feeding, kangaroo care, facilitated tucking], therapeutic play)	7	10	1	18
Self-management/education*		2		2
Mixed (physical + psychological)	1	19	2	22
Total number of systematic reviews	26	116	4	146

*Ten systematic reviews reported education as a supplementary strategy to the primary NPI

Across the included reviews, the NPIs were delivered for a variety of pain experiences. 54 reviews examined NPIs to manage acute pain (pain associated with specific medical conditions, post operative surgical pain and pain anticipated and/or associated with medical tests and procedures) (168,171,172,175,177,178,180,181,188,191,193,197,201,211,213,216,218,221,223–226,230,231,236,238,240,243–245,248,250–252,258,261,263,269,271–273,277,279–281,284,287,293,295,297,300,303–305), 66 reviews examined the use of NPIs for chronic pain management (this included studies examining NPIs for neuropathic pain and nociceptive pain) (165–167,169,170,173,176,179,184–187,189,190,192,195,198,199,202–208,210,214,215,217,219,220,228,229,232–235,237,239,241,246,249,256,257,259,260,264, 267, 268,270,275,276,278,282,283,288–291,298,302,306–310) and 26 reviews examined the use of NPIs for medical conditions or experiences that included both acute and chronic pain (174,182,183,194,196,200,209,212,222,227,242,247,253–255,262,265,266,274,285,286,292,294,296,299,301). Five reviews looked at studies examining acute or chronic pain conditions in both adults and children (168,179,271,275,279). See **Table 16** for further details.

Table 16: Number of systematic reviews focused on non-pharmacological approaches: Type of pain and population

	TYPE OF PAIN			
Population	Acute pain	Chronic pain	Acute and chronic pain	Total number of systematic reviews
Infants, children (including adolescents)	21	4	1	26
Adults	30	57	24	111
Older adults		3	1	4
Both children and adults	3	2		5
Total number of systematic reviews	54	66	26	146

The NPIs were further classified by pain etiology (e.g., musculoskeletal pain) or the context in which the NPI was delivered (e.g., before and during painful medical procedures). 65 of the included reviews delivered a range of interventions to address pain experienced by people living with MSK pain (165,169,171,172,174,176,179,180,182–184,186,190,196,200,202,204,206,207,209,212,214,215,217,220,222,225,226,229,232,234,241,242,246–250,252–254,256,257,259,260,262,264,266–268,270,274,278,282,283,285,286,288–291,294,296,306,308). 50 reviews specifically examined physical or physiotherapy discipline-based interventions (e.g., supervised exercise) for a variety of health conditions that cause MSK pain (e.g., arthritis) (165,171,179,180,182–184,186,190,196,200,202,204,207,214,215,220,222,225,226,229,232,234,241,242,246–250,254,256,259,260,262,266–268,274,278,282,285,286,288–291,294,296,308), four reviews examined the delivery of psychological NPIs for MSK pain (206,212,270,283), one review looked at the use of self-management NPIs for MSK pain (306) and ten reviews examined a combination of both physical and psychological NPIs to address MSK pain (169,172,176,179,184,217,252,253,257,306).

Five reviews examined NPIs to address neuropathic pain (166,192,235,239,302), wherein three addressed physical interventions (235,239,302), one examined a psychological intervention (192) and one review examined a mixed approach (166). Ten reviews examined NPIs for people living with cancer (167,170,189,227,228,238,245,255,279,300), and four reviews looked at the use of both physical and psychological approaches to address this type of pain (167,189,228,255). Thirty of the reviews examined a range of NPIs to address pain anticipated and/or experienced during health care procedures (168,175,177,178,181,191,193,194,197,201,211,213,216,218,221,230,231,236,244,250,251,261,263,271,273,277,281,287,293,295).

Ten reviews examined the use of NPIs in the pre-or post-operative setting (172,224,240,243,269,280,284,297,301,304). These interventions were psychological, physical, delivered in combination or used music therapy. Fifteen of the reviews looked at NPIs for people living with generalized or chronic pain conditions (e.g., fibromyalgia) (187,194,195,198,203,210,219,270,275,276,283,288,299,307,309). These included ten reviews looking at physical or psychological interventions or both in combination (187,198,203,270,276,283,288,299,307,309); two reviews examined occupational therapy-based interventions, specifically examining the use of pacing (195,210); and the remaining reviews examined other strategies such as music therapy or animal-assisted therapy, to address generalized or chronic pain conditions (194,219,275). Finally, six reviews examined physical interventions for a variety of other conditions such as endometriosis, acute headaches and postpartum pain (208,226,258,272,298,303) and one review used a psychological approach to address chronic pain from a brain injury (237). Please refer to **Table 17** for the full details.

Table 17: Number of systematic reviews focused on non-pharmacological approaches (NPI): Type of NPI and pain etiology/context

TYPE OF NPI	PAIN ETIOLOGY/CONTEXT							TOTAL NUMBER OF SYSTEMATIC REVIEWS
	MUSCULO-SKELETAL PAIN	NEURO-PATHIC PAIN	ONCO-LOGICAL PAIN	PROCEDURE-RELATED PAIN	PRE/POST-OPERATIVE PAIN	GENERAL CHRONIC PAIN	OTHER EXPERIENCES OF PAIN	
Physical	50	3	1	1	2	4	6	67
Occupational therapy						2		2
Psychological	4	1	3	20	3	5	3	39
Other psychological NPIs:								
Music therapy			1	4	2	1		8
Comfort				3				3
Animal-assisted therapy						2		2
Therapeutic play				1				1
Psychological and other NPIs			1					1
Mixed (physical and psychological)	10	1	4	1	3	1	1	21
Self-management	1						1	2
Total number of systematic reviews	65	5	10	30	10	15	10	146

Table 18 delves further into the specific NPIs for pain management by population across the 146 reviews. Physical interventions were predominantly delivered for the adult population (however there was one pediatric review) and included a range of approaches delivered by physical therapists or other health providers including nurses. Active interventions included structured sessions that involved walking, exercises, aerobic conditioning, strength and balance training and various other interventions such as myofascial release, aqua therapy and breathing exercises (165,171,174,179,180,183,186,187,196,200,202,204,214,215,220,225,229,239,241,242,246,248,249,256,260,266–268,278,282,285,288,290–292,294,297,302). Some interventions included an educational component in the intervention delivered by the health provider. Passive physical NPIs included acupuncture (170,223,232–235,254,286,298,299), dry needling (207,258,262,289), acupressure (301), therapeutic ultrasound (190,296), transcutaneous electrical nerve stimulation (TENS) (203,222,259,274), percutaneous electrical nerve stimulation (PNS) (259), heat or cold application (182,226,250,272) or a combination of active and/or passive interventions used together (185). One physical intervention was examined in a review that included the pediatric population (179) and one review looked at a combination of physical interventions in older adults (185). It should be noted that massage was examined in one systematic review in the post-operative adult intensive care setting (243), and was also a NPI that was captured in thirteen reviews where passive and active physical interventions were used in combination or in reviews where a number of physical approaches to non-pharmacological pain management were included in the context of each review (173,185,188,189,243,252,255,265,278,284,288,301,303,304).

Psychological NPIs to address pain were the focus of ten reviews that specifically examined cognitive behavioural therapy or acceptance and commitment therapy in adult and pediatric populations (178,195,198,208,212,237,270,280,283,309). The bulk of psychological approaches were conducted in pediatric settings and included the use of distraction methods to address pain management experienced by children (168,191,197,201,216,230,231,236,244,245,261,271,277,281,287,293). Distraction methods included the use of virtual reality technologies including gamification (191,192,199,201,206,216,230,231,236,244,245,271,277,281,293), guided imagery (168), interactive video games (261), vibratory devices (287), clown therapy (197) and the use of the Valsalva maneuver (218). Distraction interventions also included other important intervention elements such as relaxation (224) and social support (parents or caregivers) (175,181,193,211,213).

Table 18 outlines other NPIs for pain management including the use of music therapy in adults (221,238,240,251,269,273,279,300) and music therapy in older adults to address pain experiences (219). Other interventions involved strategies that provided comfort and were conducted in pediatric settings included breastfeeding (175,193), feeding sucrose (193,213), kangaroo care or facilitated tucking (213) to address the experience or anticipated experience of pain. In addition, in the pediatric setting one review examined the use of therapeutic play to address pain (211). Two reviews in the adult setting looked at NPIs to address pain using relaxation or art therapy (224,227).

Table 18: Number of systematic reviews focused on non-pharmacological approaches (NPI): NPI subtype and population

		POPULATION			
TYPE OF NPI		CHILDREN AND ADOLESCENTS	ADULTS	OLDER ADULTS	TOTAL NUMBER OF SYSTEMATIC REVIEWS
Physical Therapy					
Active	Exercise (walking, aerobic, strengthening and balancing, myofascial release, breathing, etc.)	1	36		37
	Aqua therapy (exercise)		2		2
Passive	Acupuncture		10		10
	Dry needling		4		4
	Acupressure (auricular)		1		1
	Massage		1		1
	Therapeutic ultrasound		2		2
	TENS/PNS		4		4
	Cold/Heat application		4		4
	Multiple passive interventions		1		1
	Active and passive interventions			1	1
Multiple physical interventions		3		3	
Occupational Therapy					
	Pacing, exercise, range of motion, ADLs, assistive devices		2		2
Psychological approaches					
	Cognitive behavioural therapy/acceptance and commitment therapy/mindfulness, meditation	2	8		10
Distraction approaches (this intervention also includes relaxation, social support and may include parent or caregiver)	Virtual reality, gamification	12	3		15
	Guided imagery	1			1
	Interactive video games	1			1
	Vibratory devices	1			1
	Clown therapy	1			1
	Valsalva maneuver		1		1
	Animal-assisted therapy	2			2

		POPULATION			
TYPE OF NPI		CHILDREN AND ADOLESCENTS	ADULTS	OLDER ADULTS	TOTAL NUMBER OF SYSTEMATIC REVIEWS
Comfort	Breastfeeding, sucrose feeding, kangaroo care, facilitated tucking	3			3
	Touch/visual distraction	1			1
	Therapeutic play	1			1
	Relaxation		1		1
	Art therapy		1		1
Multiple psychological methods		4			4
Mixed (physical and psychological)		1	16	2	19
Other NPIs					
Music therapy			8	1	9
Self-management			2		2
Music, psychological		1			1
Total number of systematic reviews		32	110	4	146