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Systematic Review

How does the Alexander Technique lead to psychological and non-physical outcomes? A realist review

Debbie Kinsey[a,*], Lesley Glover[b], Franziska Wadephul[b]

[a] Institute of Health Research, University of Exeter Medical School, Exeter, Devon EX1 2HZ, UK
[b] Faculty of Health Sciences, University of Hull, Hull HU6 7RX, UK

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ABSTRACT

Introduction: The focus of previous research on the Alexander Technique (AT), a psychophysical self-management approach, has mainly been in musical performance, physical change, and health outcomes such as pain. This rapid realist review aimed to understand psychological and non-physical outcomes of the AT, and how they may be generated.

Methods: Using a rapid review approach, papers with relevance to non-physical outcomes were identified using backward and forward citation searching from two key systematic reviews and consultation with AT experts.

Results: Thirty six documents were included for analysis, which resulted in 8 evidence-informed theory statements on how and for whom non-physical outcomes can be generated by AT lessons. A variety of non-physical outcomes of the AT were found, including improved general wellbeing and increased confidence to address present and future challenges, as well as identifying that difficult emotions can arise in lessons. Two main causal pathways were identified – 1) improvements in physical wellbeing leading directly to psychological wellbeing; and 2) an experience of mind-body integration leading people to apply AT skills to non-physical situations.

Conclusions: The AT may be a useful approach in a range of settings for psychophysical, long-term outcomes, and further research is warranted. We suggest a number of recommendations for practice and further research, including for AT teacher training and the need for mixed-methods research in the AT, and factors which support a person to gain benefit, such as openness to self-management and support to attend regular lessons.

1. Introduction

The Alexander Technique (AT) is an educational self-management approach which aims to provide people with the skills to recognise, understand, and change habits primarily impacting movement and posture [1]. It is usually taught in one-to-one lessons in which the teacher uses gentle hands-on contact and spoken guidance to convey the principles and skills of the technique, as applied to common activities such as walking, sitting, and standing [2,3]. It is a psychophysical approach, understanding functioning as holistic with mind and body indivisible [4]. See Woods et al [4] for a full introduction to the AT.

There have been three main areas of focus in research on the AT. One area of focus has been on the bio-mechanical changes associated with learning the AT, such as gait [5] or postural tone [6]. Another body of literature has focused on the AT and musicians, both in relation to the quality of performance and performance anxiety (e.g. Valentine et al [7]). In health research, studies are largely focused on health outcomes related to specific conditions such as Parkinson's symptoms [8] or chronic pain [1], with primary outcomes including improvements in pain [1,9], balance [10], or disability [8]. Three systematic reviews have also been published – on the effectiveness of AT lessons in medical and health-related conditions [11], on the AT and musicians [12], and a review of controlled clinical trials [13].

Within the published literature there is reference to outcomes related to a sense of wellbeing or to psychological changes associated with learning the AT, even where this was not the focus of the study itself. For example, in their study of the efficacy of the AT for chronic neck pain, Lauche et al [14] reported that patients became more relaxed and confident as a result of feeling more at ease moving, with some 'resolving their wider problems' by taking these changes into their daily lives, though the authors did not give further detail on what this meant or how. To date there has been no attempt to draw together these non-physical outcomes to gain a greater understanding of these changes or how these changes may come about.

The AT is non-dualist in approach, however focusing on a particular kind of outcome means distinguishing between, and separating out, different kinds of outcome. For this review, we have chosen the term 'non-physical outcomes' to include psychological and wellbeing outcomes, for

* Corresponding author.
E-mail addresses: D.Kinsey@Exeter.ac.uk (D. Kinsey), L.F.Glover@Hull.ac.uk (L. Glover), F.Wadephul@hull.ac.uk (F. Wadephul).

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example mood, sense of self, cognitive processes (such as the way people think), confidence, and emotion. This is to distinguish these outcomes from physical outcomes which have been the focus of previous research. For the purposes of this review, 'physical outcomes' include gait, posture, and pain. We acknowledge that all physical outcomes include psychological processes, for example how the subjective experience of pain is both a physical and psychological process, and mood and experience of pain can mutually influence each other. This review will focus on non-physical outcomes – physical outcomes, such as change in gait or level of pain, will not be explicitly included in the review. However, physical outcomes and processes will be included where they contribute to theorising around non-physical outcomes, for example where reduction in pain may contribute to improvements in mood. Therefore, although separating 'non-physical' and 'physical' *outcomes* could be considered dualist (as they do mutually impact each other and are integrated), and in contradiction of the holistic ethos of the AT, we have made the pragmatic decision to take a dualist approach in relation to identifying outcomes, while integrating the *processes* considered.

Intervention and health-based research is increasingly moving beyond examining simply *what* the outcomes may be, to *how* these outcomes may be generated, including *for whom* they may work [15]. This enables a deeper understanding of how complex interventions may work, and leads to more specific policy, practice, and research recommendations [15].

This review will therefore examine non-physical outcomes of the AT, and specifically how these outcomes may be generated and for whom.

2. Methods

This review uses a realist approach to synthesis. Rather than simply *what* non-physical outcomes there may be, we were interested in *how* these outcomes may be generated, and realist approaches are designed to answer explanatory questions, asking how, in what circumstances, and for whom [16]. The product of realist reviews is evidence-based theory in answer to the research questions, with 'theory' meaning a description of how an intervention leads to particular outcomes (in which contexts, for which populations, and by which main mechanisms) [17]. Realist theorising is conceptualised using context-mechanism-outcome (CMO) configurations, where the interaction between the context and mechanism leads to the outcome (C+M=O) [18]. 'Mechanisms' comprise the resources offered by the intervention, and the participant's reasoning in response to those resources [18]. The context is any condition which triggers the mechanism [19], and can include factors such as participant characteristics (e.g. personal history or demographics), environment (e.g. where the intervention takes place), and wider culture and politics (e.g. policy or cultural norms). Where an intervention or programme happens over time (such as over a number of AT lessons), an outcome can become a new context, such as trust being built (or not built) in an early phase of an intervention (outcome), becoming the context for how and whether the intervention proceeds in the next phase [20].

There are different ways of visualising and conceptualising CMOs. Alongside Pawson and Tilley's [18] original "C+M=O" conceptualisation of CMO configurations, Dalkin et al.'s [21] separate out the mechanism's resource and reasoning in order to highlight that resources are introduced into an existing context. In their method, the mechanism's resource (M/resource) is introduced into a context (C), which together change reasoning or behaviour (M/reasoning), leading to the outcome (O), illustrated in Fig. 1.

Realist methodology includes scope to search iteratively and widely, beyond the programme or intervention itself, to fill theoretical gaps. However, given this requires a considerable amount of time and resources, rapid realist reviews have been used to allow realist theorising and knowledge-building within a shorter timeframe [22]. Our rapid approach (as described below) limited the timeframe for searching, but not for appraisal or analysis.

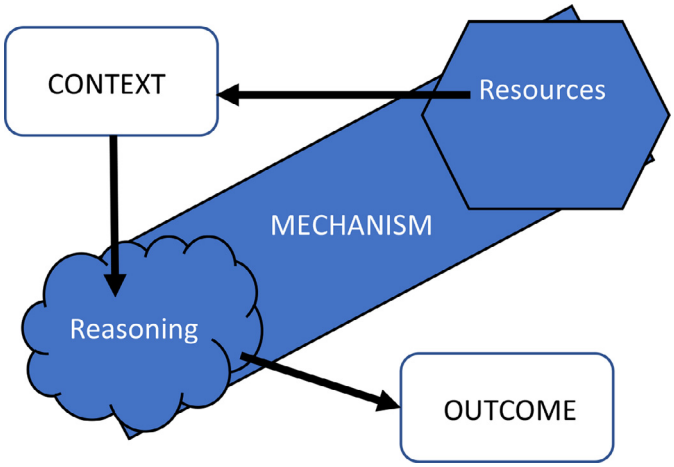

Fig. 1. The intervention's resources are introduced into an existing context, which together affects the participant's reasoning, which leads to the outcome. Dalkin et al. [19].

This methods section is structured according to the RAMESES reporting standards for realist reviews [15].

2.1. Developing initial theory

In realist reviews, an initial rough theory is developed to guide the review. The initial theory for this review was developed by LG & FW through a scoping of literature on the AT where 'non-physical' outcomes or processes were mentioned. Including experiential expertise in developing theory is commonly part of the process in realist reviewing, so FW's experience in AT lessons, and LG's experience as an AT researcher and STAT-registered AT teacher, were also drawn upon. The initial theories were used to guide the parameters of the search and provide transparency of thinking prior to commencing the synthesis, and are given in Supplementary File 1.

2.2. Search strategy

Using a rapid review approach to boundary the search, the search strategy used two systematic reviews of the AT as a starting point [11,12]. A third, older, systematic review [13] was not included as all papers in their synthesis were included in the more recent reviews. Documents for inclusion were identified as follows:

1. Relevant documents identified in two systematic reviews of the AT [11,12];
2. Relevant documents suggested by experts in the AT and known to LG through her previous work in AT teaching and research;
3. Forward and backward citation searching of the starting reviews and documents identified in steps 1 and 2.

2.3. Inclusion and quality appraisal

Documents were included if they had relevance to the research question. Specifically the document:

- Included outcomes or processes related to non-physical outcomes;
- Included empirical study of the AT, rather than simply an opinion or editorial;
- Differentiated between the AT and other interventions in their analysis, if more than the AT was included;
- Was written in English and available to the authors;
- Dissertations were included if they met the above criteria and provided data additional to those in any published articles derived from the work, which may also be included.

All documents were initially assessed for inclusion by LG and FW. The final list of documents for inclusion were discussed and agreed upon by all three authors.

The RAMESES guidelines for realist reviews do not recommend using quality checklists to assess study quality, particularly as a range of grey and published literature may be included and only parts, rather than the whole, of documents may be relevant [17]. Realist quality appraisal is also not based on a hierarchy of methodology or study design, but on the relevance and rigour of evidence within documents [17]. Each piece of evidence from studies is considered within the synthesis as a whole, for example data from a less rigorous study may be supported by more trustworthy data in another. Quality appraisal therefore occurred in parallel with the literature synthesis, and was related to the relevance and rigour of a particular piece of data in the context of the synthesis itself [23].

2.4. Data extraction

Included documents were imported into NVivo and coded for non-physical outcomes and processes. Each document was reviewed three times to ensure relevant data was not missed, and that codes found in other papers could be assessed. 'Code sheets' for each code were created, which included all extracts and their origin related to that code.

2.5. Data synthesis

Code sheets were annotated with theorising on whole, or part, CMO configurations, and for how different extracts and code sheets may link together. These annotations were then used to develop programme theories. Patterns of causal mechanisms, contexts, and outcomes were identified across included documents, and, as per Pawson [24], evidence was juxtaposed, adjudicated, reconciled, consolidated, and situated, in order to refine and develop programme theory. This was completed both within and across code sheets, but always within the context of the particular document to ensure contexts, mechanisms, and outcomes were assessed in configuration [25]. This was an iterative process, moving back and forth between the level of individual data extracts, code sheets as a whole, complete documents, and programme theories, as a way of integrating categorising and connecting analyses [26] and conducting quality appraisal [23].

2.6. Search results

Thirty-one documents were identified from the reviews, eleven by AT experts, and forty-five from citation searches. Following full-text review of these eighty-seven documents, thirty-six documents reporting on thirty-four studies were included (28 journal articles, 1 non-peer-reviewed research report, and 7 dissertations). A flow diagram of the search process and reasons for exclusion is given in Fig. 2. The included documents are summarised in Supplementary File 2.

3. Results

The synthesis resulted in eight programme theories about how the AT can lead to non-physical outcomes. These are presented with supporting evidence within three sections for ease of comprehension: (i) overarching pathways to non-physical outcomes, (ii) specific non-physical outcome pathways, and (iii) difficult emotions. Where possible, the theories use Dalkin et al.'s [21] method of structuring CMO configurations whereby the mechanism's resource (M/resource) is introduced into a context (C), which together change reasoning or behaviour (M/reasoning), leading to the outcome (O) (Fig. 1). Where there was not enough evidence to support the separation of mechanism into resource and reasoning, we simply identify the mechanism as a whole in line with Pawson and Tilley (C+M=O) [18]. A visual mapping of the theories is given at the end of the results section in Figs. 3–5.

(i) - Overarching pathways to non-physical outcomes

The literature suggests people experience non-physical outcomes in two main ways. Firstly, they may feel psychologically better simply through moving with more ease or having reduced pain (Theory 1). For some, however, the process is a more profound shift in ways of thinking. Through exploring their physical habitual responses, they gain an experience of a mind-body integration, and start consciously applying the AT to non-physical habitual patterns, which results in non-physical outcomes (Theory 2).

Theory 1. *Psychological wellbeing from physical improvements*

When a person changes their habitual physical responses *(C)*, they move with more ease, experience less pain, and/or feel more connected to their environment *(M)*, and experience increased wellbeing, relaxation, and a sense of control and confidence *(O)*. This may also increase their desire to continue with lessons and applying the AT to different areas of their life *(O)*.

Moving with more ease was linked to a feeling of wellbeing, control, and/or confidence in eleven documents (ten studies) [8,14,27–35]. Reduced pain was also linked to a sense of control [36] and to increased wellbeing in general [37,38]. One study suggested that awareness of the body was emotionally pleasurably in itself [31], and another that physical relaxation led to emotional wellbeing [39]. One participant in Jones and Glover's [39] study said that being able to walk again meant she felt she could now 'enjoy life'. Four studies include participants describing either an increased connection to their environment [37] or an increased environmental awareness [10,30,40], which led to emotional wellbeing or reduced anxiety. Two studies explicitly mentioned a feeling of wellbeing immediately following a lesson [28,38], with one suggesting this encouraged students to attend future lessons [28].

One study found a lack of outcomes in emotional wellbeing and linked this in their discussion to their lack of outcomes in physical ability [33], suggesting that emotional outcomes come directly from physical ones.

Theory 1 is also linked to a sub-theory in which the release of physical tension caused by emotional stress leads to improved psychological wellbeing. This is not a *conscious* application of the AT to psychological health (as in Theory 2), but related to the link between psychological and physical tension which may or may not be explicit to the person.

Theory 1a. *Reduced emotional stress from changed physical response*

When a person's emotional stress includes a habitual physical response or tension *(C)*, and they learn to change their habitual physical response in stressful situations *(M)*, they feel less emotionally stressed *(O)* and more in control *(O)*.

Armitage [28] theorised in her discussion that some participants may be breaking a cycle of negative posture-memory links by changing their posture at times of emotional stress. This theorising was supported by a number of studies. Chou [41] described realising that she had developed habitual physical tension from a historical psychological stress in a particular situation (context). One participant in Krim's [30] study who described attending to how the body feels in stressful situations and adjusting their body (releasing muscular tension) in order to feel less stress, and by Kristl [42], who described learning a conscious focus on releasing physical tension to reduce anxiety. Santiago [43] discussed participants gaining an awareness of a cycle of feeling anxious linked with physical tension, and breaking this cycle through addressing their physical tension, and subsequently feeling less anxious. Dennis [35] quoted one participant saying that they had learnt how to stand tall and that this made them feel more confident. Relatedly, a participant in Saunderson's [27] work suggested that having a more confident posture meant others treated them as more confident, so they responded to that expectation and kept altering their posture to appear more confident, which ultimately led them to feel more confident from the experience of postural change.

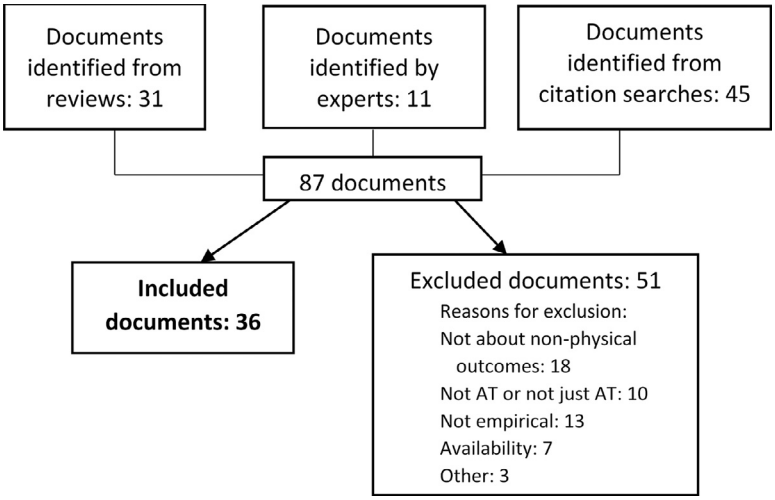

Fig. 2. Search and inclusion flow diagram.

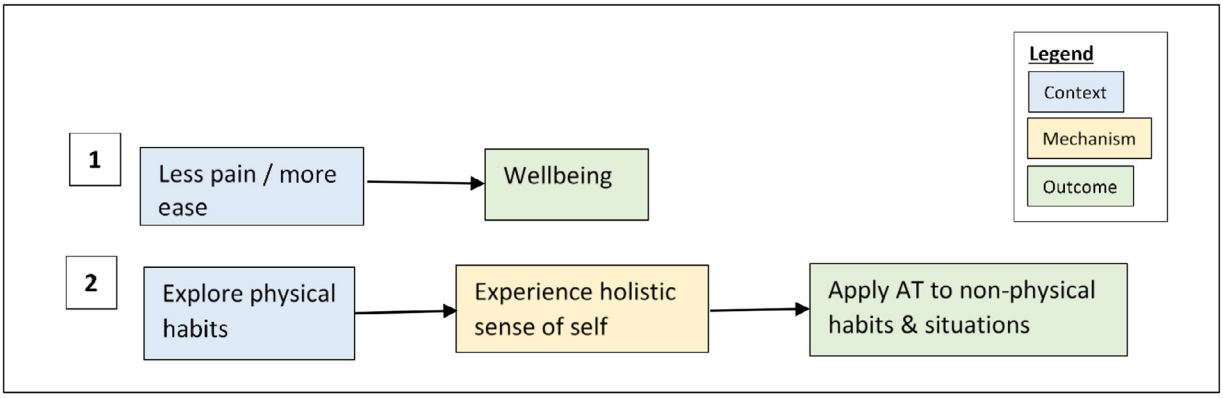

Fig. 3. Pathways to non-physical outcomes.

Theory 2. *Experience of mind-body integration*

When a person learns conscious awareness of their habitual physical responses and explores non-habitual ways of being *(C),* they gain an experience of a mind-body integration and develop a more holistic sense of self *(M),* and so apply their AT skills to non-physical areas such as ways of thinking or when they notice physical tensing in emotionally driven situations, for example in interpersonal situations *(O).*

The full programme theory was supported by three studies [30,36,44], and increased awareness leading to a more holistic sense of self was described in six studies [27,32,36,42,43,45]. Applying the AT to a physical problem, such as pain, leading to a feeling of a holistic sense of self was described in one study [41], and a conscious attention to physical habits leading to conscious attention to the non-physical was discussed in another [37]. One study examining the impact of the AT on people with learning disabilities described one participant who learnt a social 'opening up' from the experience of a physical 'opening up' in lessons [46].

(ii) - Specific non-physical outcome pathways

There were a number of specific ways people could experience non-physical outcomes within the pathways of Theories 1 and 2. The following theories occur mainly through the pathway of Theory 2, however Theories 5 and 6 include both Theory 1 and Theory 2 pathways.

Theory 3. *Becoming aware of possibilities and making informed choices*

Where a person is open to the AT or self-management approaches in general, and has the capacity to attend AT lessons and practice applying it outside of lessons *(C)*, they learn to recognise unhelpful (unconscious) habitual patterns and become aware of more possibilities in responding *(M/resource)*, so they are able to make conscious informed decisions and make changes based on their wants and needs *(M/reasoning)*, which leads to a sense of control and confidence, and improved wellbeing and mood *(O)*.

Evidence of people gaining an increased awareness of their non-physical habitual responses and then making new conscious, informed responses was apparent in seven documents commenting on six studies [28–30,37,38,40,42,45], one of which linked this process to increased enjoyment [37]. Relatedly, three studies included participants describing an awareness of a greater number of options in how to respond [28,30,47], with one of these suggesting this lead to a greater sense of control over pain [47]. Two studies explicitly suggested an increased awareness of possible options means people are then able to make choices related to their wants or needs rather than their habits [28,45]. Three documents commenting on two studies described an increased self-awareness of habitual responses led to behaviour changes (i.e. changes in habitual response) and an increased sense of control, which lead to a feeling of empowerment [36,38,48]. The context of openness to the AT and being more likely to practice or use it includes having a personal connection to the psychophysical philosophy of the AT [30], wanting to try something new [38], and wanting a self-management or drug-free approach [38,48].

Evidence for this theory also comes from a lack of this process when the context is not apparent (when the person has no capacity to attend lessons or to practice or apply the AT, and/or is not open to the AT/self-management). Eleven documents included participants (AT students or teachers) discussing that it takes time to learn AT skills and to see a benefit [1,9,14,30,32,38,39,42,45,49,50], suggesting that people need

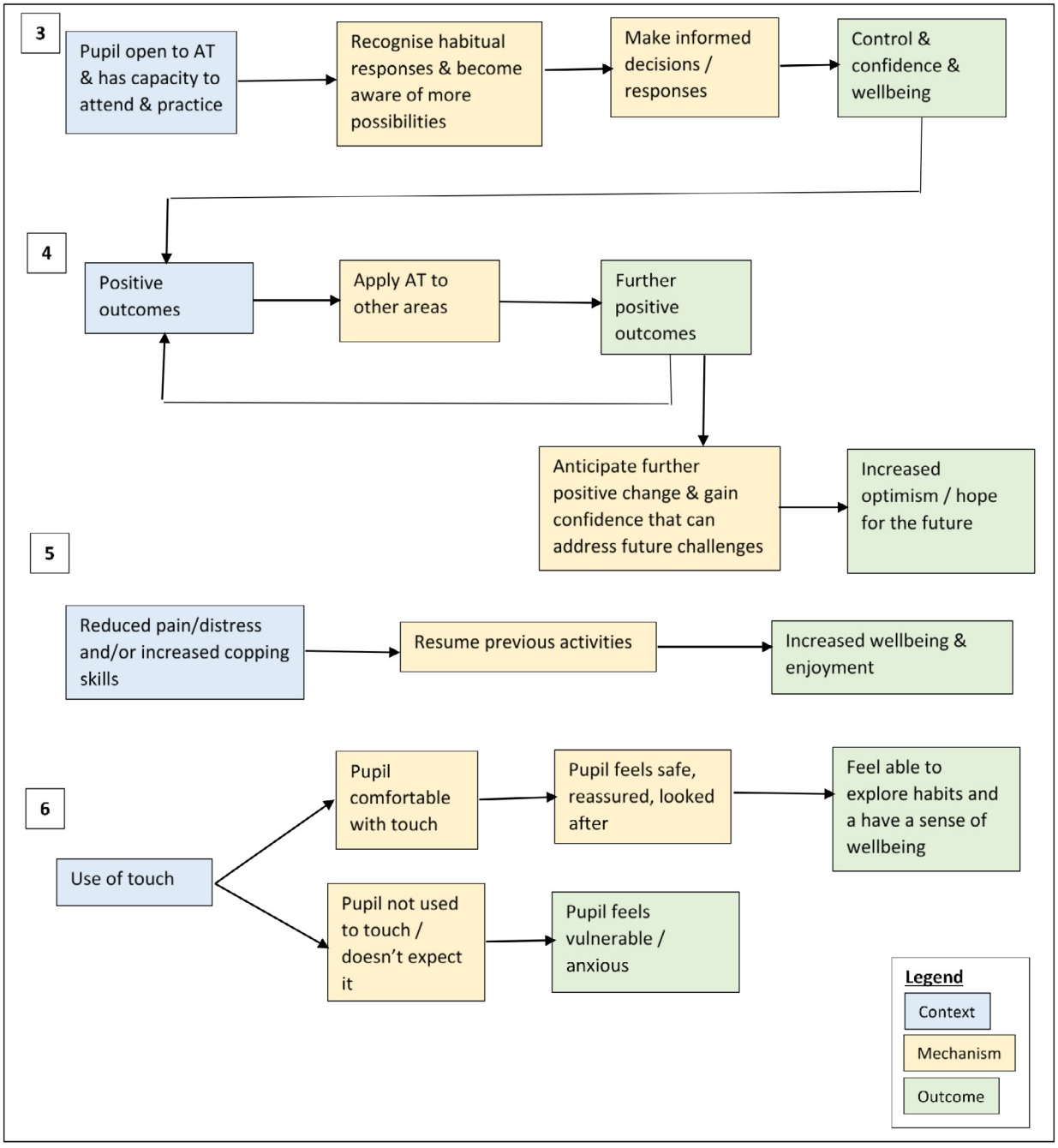

Fig. 4. Specific non-physical outcome pathways.

to attend a number of lessons and to practice, though the research was not clear on how many lessons were optimal (which will be considered further in the discussion). The literature suggested a number of factors which may impact on a person's capacity to attend lessons regularly, including having the ability to pay for lessons or travel [14,34,38,49,50] and having the time to attend regularly [49,50]. Two studies suggested people not wanting a self-management approach lead to them not practicing the AT or integrating it into their daily life, which ultimately led to a lack of outcomes from the AT for those participants [9,14]. Similarly, one person in Wenham et al's [36] study did not experience an impact of the AT, and said they did not apply it in their daily life because it did not fit into their lifestyle. Four studies highlighted the importance of the type of situation as part of the person's capacity to apply the AT, as participants were not able to apply the AT (and so gain outcomes) in activities which were more highly-pressured, time-limited, or highly focussed on product, rather than process [7,30,32,38]. For example, music students in Valentine et al.'s [7] study experienced outcomes such as reduced anxiety in a low-pressure performance, but not in a high-pressure performance, which was attributed to not being able to apply the AT in the latter.

Theory 4. *Ripple effect of positive changes*

Where a person has made changes as result of the AT and has experienced positive impacts such as increased wellbeing *(C),* they feel confident in themselves and the AT as an approach so continue to apply it or apply it to other areas *(M/reasoning)* because AT skills can be applied to situations not covered within lessons *(M/resource)*. They then gain further positive impacts *(O),* which feeds back into the cycle of positive changes, increased confidence, and further changes *(O)*. They

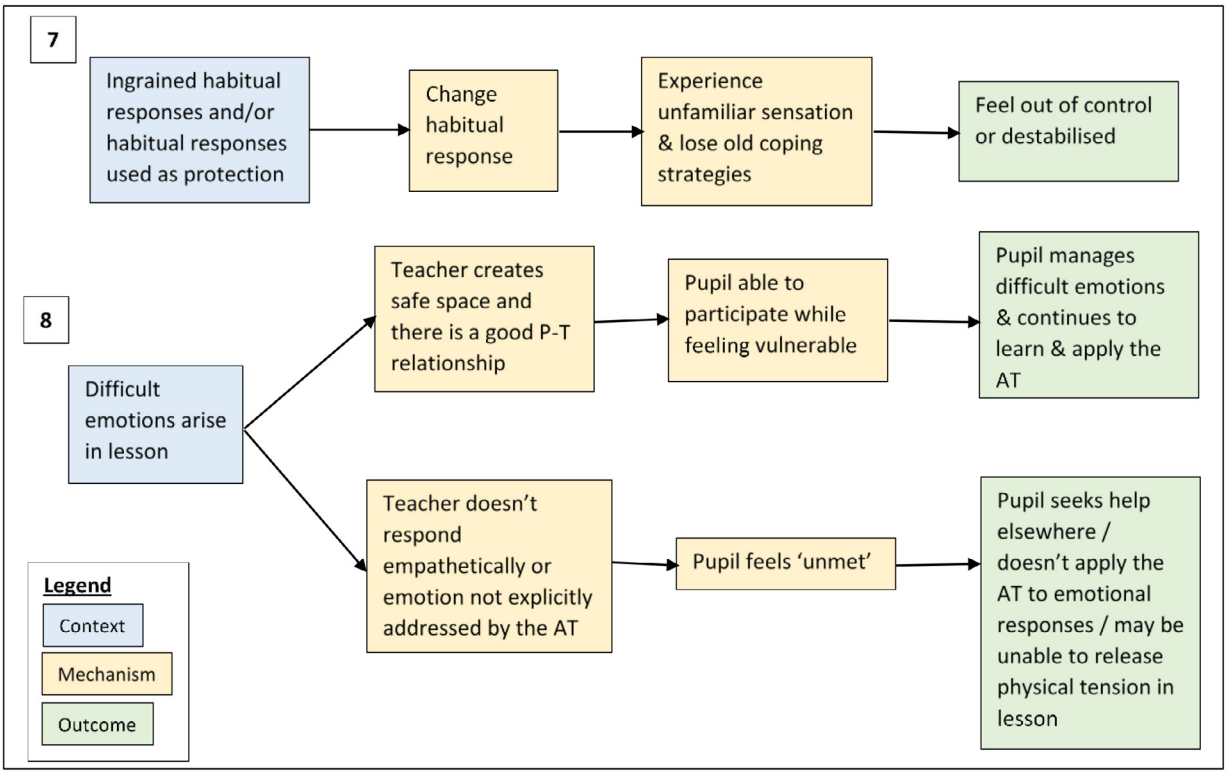

Fig. 5. Difficult emotion pathways.

may also then anticipate further positive change and confidence in their ability to address future changes *(M),* and feel increased optimism and hope for the future and reduced anxiety *(O)*.

The outcome of Theory 3 becomes the context for Theory 4 (as illustrated in Fig. 4). This ripple effect of positive change leading to further application of the AT in other areas and subsequent changes is described in five documents describing four studies [27–30,44], and an intention to apply the AT to other areas following a positive impact in one further study [41]. Similarly, Wenham et al [36] described ongoing improvements in wellbeing and pain management, and Krim [30] included a participant describing a ripple effect of repeatedly getting a positive outcome in one situation, so they gained experience of what that felt like, and so were able to do it again in the future and apply those skills in other situations. That the AT can be applied outside of lessons, to a variety of situations not covered within lessons, was linked to creating impact after lessons ended [38], increased self-efficacy [8,27,36,51], increased sense of control over pain [36], and increased self-confidence [8]. Two documents describing one study included participants saying they anticipated further positive change in the future due their experiences applying the AT [28,29]. The literature suggested this cycle of positive change increased participants' confidence in their ability to address future challenges [27,28,30,42,44,49], and increased their optimism or hope for the future [28,30,36,38,49].

Theory 5. *Confidence to resume avoided activities*

When the person has reduced pain/anxiety or increased skills for managing this (without symptom reduction) *(C)*, they feel more confident and do/resume activities previously avoided/stopped due to symptoms *(M)*, and feel increased wellbeing, enjoyment of life, and feel less disabled by their symptoms *(O)*.

Five studies explicitly included participants resuming activities that were previously avoided or stopped due to pain or anxiety [29,38–40,50], and one study described pain not impacting participants' lives or activities as much [47], and this was linked with increased wellbeing or enjoyment, and feeling less disabled by any continuing symptoms. For some this was linked to a reduction in pain, such as a participant in Jones and Glover [39] describing how the AT helped them to recover from a skeletal problem, which meant they could now walk with more ease and 'enjoy life'. However, others did not experience symptom reduction but used the AT as a means of coping with, for example, pain, which meant they did more activities, leading to an increased enjoyment of life and a general wellbeing [38]. Similarly, one participant in Saunderson's [27] study stated that having the 'tools' of the AT gave them the confidence to do activities they thought they might not be able to manage like gardening. Glover et al [40] found that, although some participants experienced a reduced fear of falling following AT lessons and others did not, all participants resumed activities they had previously avoided, such as getting off the bus alone. Nine documents reporting on eight studies suggested a changed relationship with pain or difficult emotions, rather than a symptom reduction [28–30,36,38,40,42,50,51]. This theory suggests that people can experience increased wellbeing through an opening of their world through new activities, when they have either experienced a symptom reduction (Theory 1 pathway), or have developed coping strategies to deal with the same symptoms through the AT (Theory 2 pathway).

Theories 6a & 6b – use of touch

The use of touch in the AT can elicit positive or negative emotions in students, and is linked to Theory 8 in the following section about the impact of how teachers respond to difficult emotions.

Theory 6a. *Touch and positive emotions*

Where a person is comfortable with touch *(C)*, the use of touch in the AT makes them feel looked after, reassured, and safe in vulnerability *(M)*, so they feel able to explore their habitual responses and have a sense of general wellbeing *(O)*.

The full CMO for eliciting positive emotions through touch was described by participants in Jones and Glover [39], who specifically focused on processes underlying touch in the AT. Additionally, this study

and McClean and Wye's [38] also included participants linking the use of touch as a means of being given permission to relax in the session, which was pleasurable.

Theory 6b. *Touch and negative emotions*

When a person is not used to touch or surrendering control, or does not expect it *(C)*, and touch is used in the AT lesson *(M),* they can feel vulnerable or anxious *(O)*, until they get to know or become comfortable with their teacher *(O)*.

The full CMO was described in Wenham et al's [36] study, and was the only study which included a lack of expectation of touch as a context, perhaps because they were working within a medical setting with people who had not specifically sought out the AT. Two documents reporting on one study found that touch made some students feel vulnerable or anxious during early lessons, until they became used to it or built a relationship with their teacher [28,29]. Similarly, Jones and Glover [39] found touch may make some feel vulnerable, and that feeling comfortable with the teacher was important in managing this. AT teachers in Mowat's study [52,53] suggested that a person not being used to touch, reassuring touch, or surrendering control could lead to a feeling of vulnerability or anxiety in response to touch in AT lessons, which one participant linked to being put into a state of emotional regression leading to developmental issues coming to the surface.

(iii) - Difficult emotions as an outcome

Difficult emotions can be a non-physical outcome of the AT, and can shape the progress of learning or interrupt learning, impacting other outcomes. Difficult emotions can arise at the beginning of learning to apply AT lessons (Theory 7), and at any time during the course of lessons (Theory 8). How the teacher responds to this is important.

Theory 7. *Loss of familiar coping strategies*

When a person who has very ingrained habitual responses, or uses their habitual responses as a means of self-protection or coping with difficult emotions, *(C)* first changes their habitual response *(M/resource)*, they experience a different & unfamiliar sensation and lose old coping strategies *(M/reasoning*), so feel out of control and destabilised *(O)*.

The full CMO was described in two studies of performers using the AT, both of which described having very ingrained habitual patterns leading to a sense of destabilisation or loss of control when first changing their ways of responding [32,41]. The full CMO was also described by a participant in Saunderson [27] who used their existing responses has a means of self-protection and coping and initially struggled emotionally when changing these responses. Tarr [45] reported feeling a loss of an aspect of 'self', and feelings of discomfort and irritability, following three hours of being worked on by AT teachers on a training course. Two studies included participants who experienced a vulnerability, fear, or sadness when letting go of habitual responses [29,43], and three included those who described letting go of habitual patterns as difficult [28,30,32].

Theory 8. *Difficult emotions being managed or unmanaged*

When difficult emotions arise in a lesson *(C)*, and the teacher creates a 'safe space' acknowledging these feelings or the student and teacher have developed a good relationship *(M/resource)*, the student feels able to participate while feeling vulnerable *(M/reasoning)*, and manages the difficult emotions and continues to learn and apply the AT *(O)*.

When difficult emotions arise in a lesson *(C)*, and the teacher does not respond empathetically to the emotion or the AT does not explicitly address this *(M/resource)*, the student feels 'unmet' (vulnerable, uncared for) *(m/reasoning)*, so seeks help elsewhere (e.g. therapy), doesn't apply the AT to emotional responses, and may be unable to release physical tension due to their psychological tension/distress *(O)*.

The full CMO for difficult emotions being managed was described by AT teachers in Mowat's [52,53] interview study. For example, two participants described having students who became very emotional in lessons and, through responding to this empathically and creating a 'safe space', the person was able to manage this in the lesson. Related to this theory, two studies suggested that the teacher accepting the person as they are makes them feel safe and able to open up [27,52]. However, although the AT teachers in these studies also referred to their own experiences as students, no participants who are not also teachers commented on this, so it is not clear exactly what it is that helps all students to manage difficult emotions arising in lessons.

The full CMO for difficult emotions not being managed was described by participants in three documents commenting on two studies [27,52,53]. Interviewed AT teachers in Saunderson's [27] study described difficult emotions or painful memories arising in their own lessons or training, with nine participants stating they did not feel there was the space or framework within AT training for dealing with strong emotional reactions and that this could be 'scary', and one participant explicitly stating they sought psychological support elsewhere as they could not do this within AT lessons. Mowat [52,53] also interviewed AT teachers who described their experiences as a student and as a teacher. Similarly to Saunderson, Mowat's participants suggested there can often be no explicit way that emotions are addressed in AT lessons, and that teachers are not trained with how to respond to emotion. Mowat's participants described experiences of feeling 'unmet' by their teacher, which led some to seek help elsewhere.

Five documents reporting on four studies suggested that the teacher-student relationship is important in managing the process when difficult emotions, such as vulnerability related to touch, arise in a lesson [27–29,39,52]. Relatedly, five documents reporting on four studies suggested the relationship was important for satisfaction or enjoyment of lessons [34,36,38,48,49], and one included a participant stating having different experiences with different teachers [30].

3.1. Evidence for outcomes

The processes above, such as Theory 3, can lead to a number of outcomes dependant on what type of habitual patterns the person was attending to and changing. Evidence for non-physical outcomes found in this review include:

- Sense of control or confidence [8,14,27–30,35–41,43,44,47,50,54]
- Increased self-efficacy [9,27,47,51,54]
- General wellbeing [9,28–30,36,38,39,46]
- Increased quality of life [1,38]
- Improved relationships [14,28,29,36,40,44]
- Self-acceptance [28,30,39,40]
- Increased optimism/hope for the future [28,42,49]
- More holistic sense of self [27,28,30,32,36,37,41,42]
- Decreased fear/anxiety [7,8,10,30,40,42–44,46]
- Decreased depression / low mood [8,40,55]
- Decreased anger [46]
- Decreased stress [8,30]
- For some, it was also about a changed relationship with pain or difficult emotions (such as fear), rather than a decrease in symptoms [28–30,36,38,40,42,50,51]
- Difficult emotions can arise in lessons [27–29,32,36,41,43,45,52,53]

However, some studies found no impact for some or all of their participants on quantitative measures of fear of falling [10,40,56], stress [51], social and emotional wellbeing [56], and pain-related self-efficacy [47].

3.2. Interaction of theories

A visual mapping of the theories is given in Figs. 3–5, with the context shaded blue, the mechanism yellow, and the outcome in green. Fig. 3 shows the two main pathways to non-physical outcomes. Fig. 4 shows the ripple effect of the outcome of Theory 3 becoming the context for Theory 4, how Theory 4 is self-strengthening, and how the

use of touch in the AT can lead to both positive and negative emotions. Fig. 5 illustrates how difficult emotions arising in a lesson can lead to positive or negative emotions, depending on how the teacher responds.

4. Discussion

Despite the AT being largely taught within the physical domain (i.e. it is not a talking therapy or explicitly focused on mood, for example), this review identified a number of non-physical outcomes. These could be experienced through two main casual pathways – directly from improvements in physical functioning, and from experience of a mind-body integration leading to applying the AT to non-physical areas and situations. Eight evidence-informed programme theories were developed from the review.

The theories developed here may link with existing models of the AT. Cacciatore et al.'s [57] neurophysiological model of the AT is largely based in the physical but does include 'emotional regulation' resulting from improvements in postural tone and body schema. This is similar to our first pathway of non-physical outcomes (Theory 1), in that it involves the direct impact of physical improvement on the non-physical. Our findings go beyond this to add that emotional and non-physical outcomes are not always secondary, but can come from direct application of the AT to the non-physical. This means it is not only postural change which is key in outcomes in the AT, but also conscious change in non-physical habitual responses and/or mind-body integration.

We found that positive experiences with the AT could lead to increased optimism for the future and confidence to address present and future challenges. This suggests long-term application of the AT could provide a general wellbeing through individuals perceiving a balance between their own resources (AT skills which can be applied widely) and any challenges they face, as per Dodge et al.'s [58] model of wellbeing. Beyond this balance, our findings also suggest the AT can cultivate wellbeing across a range of areas, including both hedonic wellbeing (mood and life satisfaction) and eudaimonic psychological wellbeing (e.g. self-acceptance, positive relationships, and personal growth) [59].

Our findings link with the concepts of self-care and self-management. For example, patient conceptions of self-care include reflecting on one's own needs, being an expert in oneself, and taking responsibility for one's own health and lifestyle choices [60], which is similar to ideas in Theory 3 about increased self-awareness, recognising unhelpful patterns, becoming more aware of more choices, and responding according to wants and needs rather than habit. This review supports the AT as a useful and practical intervention for supporting self-care.

4.1. Recommendations and implications

The theories developed in this review suggest a number of practice and research implications. Firstly, training for AT teachers should always include the importance of being attentive to emotional responses of all kinds in those they teach. Of particular importance is an awareness that difficult emotions can arise for people at any point in lessons, as well as early in the process where there may be feelings of vulnerability related to touch, or feelings of destabilisation when first changing habits, particularly amongst performers. AT teachers should not be expected to be psychological counsellors or therapists, however given the importance of the teacher's response to emotions arising in lessons, it would be useful if training included how to manage this empathetically within lessons, such as the principles of assessment and non-judgemental listening in mental health first aid [61].

The importance of the person being open to the AT, or self-management approaches in general, suggests this could usefully to be assessed prior to referral to the AT in public health settings, or that helping the person to be open to self-management needs to be done prior to referral in order for them to gain benefit. Additionally, support should be provided to participants in trials and public health settings to improve their capacity to attend a number of regular lessons, which may include providing transport, transport costs, or childcare. This would widen the accessibility of the AT. Group work may also make the AT more accessible where this reduces costs.

The included studies in medical settings were mainly based around pain and pain management, however the theories developed in this research may suggest that the AT could be a useful intervention in public health more broadly due to the holistic, long-term impact. It may be that some people who struggle with talking therapies could benefit from the indirect approach of the AT. Some existing research has focused on people who may experience mental health difficulties related to their physical condition and include measures of impact on mood (e.g. Stallibrass et al., [8]). However, no studies have explicitly included people with mental health difficulties where psychological outcomes are the primary focus, and further research is needed with this population to see if it has a similar impact.

The theories developed in this research provide guidance on the processes, outcomes, and concepts which need to be evaluated in future AT research, or on other self-management approaches. For example, the theories suggest what constructs need to be operationalised in quantitative research, or what the focus of qualitative research may be, such as interview topics. Collecting more data on the specific theories and ideas developed here would allow further theory development and in turn further practice recommendations. Further research could be a large-scale evaluation considering all the theories, or a subset of them, such as how difficult emotions are managed within AT lessons, or which people experience mind-body integration and how. Future research could also usefully integrate our theories with physical models such as Cacciatore et al.'s [57] to develop a fully psychophysical model of the AT.

It was not clear from the current research how many lessons are needed for non-physical outcomes, though this likely varies between individuals and further research on individual context as described above may improve this understanding. Given that participants often commented on the time needed to integrate the AT in daily life and apply it to non-physical situations, future research could usefully consider the optimal, or range, of lessons needed for non-physical outcomes, particularly if the AT is to be integrated into public healthcare.

Most studies reviewed gave a brief description of the AT, but the majority did not define how they used terms such as 'habit' or 'awareness'. Future work could clarify the terms they use, or refer to articles which define terms such as that by Saunderson and Woodman [62]. However, qualitative work will be using definitions employed by the participants, which may or may not be explicitly discussed with the researchers. It may therefore be useful for qualitative work to describe whether or not participants discussed the meaning of terms, so that it is clear whether and how meanings may differ.

Finally, this review found that the variety of non-physical impacts of the AT were not always captured by quantitative measurement. For example, in Glover et al.'s [40] study, no significant differences were found on a fear of falling questionnaire, but in interviews participants described a range of non-physical outcomes, including a changed relationship with fear which enabled some participants to resume previously feared activities. This suggests future AT research should consider mixed methods approaches, to ensure unexpected or more nuanced outcomes are captured. Studies could also consider using participant-driven measures such as the MYMOP used by McClean and Wye [38] in which participants choose their own outcomes at the outset of the intervention, though these may miss areas where the person does not expect the AT to have an impact, so, again, protocols should include means of measuring unexpected impacts.

4.2. Strengths and limitations

This was the first study to draw together non-physical outcomes of the AT. A real strength was the range of studies included, such as in design, number of lessons, group and individual lessons, and the participants' reasons for learning the AT. Despite this range, there was a

convergence of outcomes, suggesting that non-physical outcomes are not dependent on, for example, having private lessons for a number of years or seeking the AT for non-physical issues. The resulting theory is also testable, which means it can be used as the basis for future research and refined to develop robust models of how and for whom the AT may work in this way.

Employing a rapid approach to the search strategy means there may have been some useful documents which were not included, particularly as there was not a systematic search for relevant grey literature. However, this was mitigated to an extent by also seeking papers from AT experts. Additionally, a review is always limited by the literature it includes, and as such we cannot make recommendations on pertinent issues such as the optimum number of lessons, or how particular groups such as those with mental health difficulties may respond to the AT. Studies ranged in quality, from more exploratory studies without recognised forms of data analysis [46], to mixed methods studies with appropriate measures and analysis [48]. However, the realist methodology of considering quality in parallel to the synthesis allowed issues of quality to be considered during theory development.

5. Conclusions

Having AT lessons can lead to a wide range of non-physical outcomes, including improved general wellbeing and increased sense of control and confidence. These outcomes can be generated through improvements in physical wellbeing, and through experience of mind-body integration and subsequent application of AT skills to non-physical areas. The AT may be a useful approach in a range of settings for psychophysical, long-term outcomes, and further research is warranted. Given patients' desire for increased provision of self-care services within the NHS [60], research could particularly focus on refining these theories and the use of the AT in healthcare settings. AT lessons may provide a significant way to improve mental wellbeing and increase agency. Further work should seek to widen its application beyond the traditionally perceived areas of movement, posture, and pain.

Author Contributions

Debbie Kinsey: Investigation, Formal analysis, Methodology, Visualization, Writing – original draft. **Lesley Glover:** Funding acquisition, Conceptualization, Investigation, Writing – review & editing. **Franziska Wadephul:** Conceptualization, Investigation, Writing – review & editing.

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Declaration of Competing Interest

LG teaches the Alexander Technique in private practice and is a member of the Society of Teachers of the Alexander Technique Research Group. DK and FW report no competing interests.

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Data availability

Not applicable. All studies reviewed included in the reference list.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.eujim.2021.101371.

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