

How does yoga practice and therapy yield psychological benefits? A review and model of transdiagnostic processes

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ABSTRACT

Interest in yoga as an intervention for psychological wellbeing has increased in recent years, with literature investigating beneficial effects in a variety of presentations and settings. The theoretical understanding of this benefit has previously focused on physiological changes involved in yoga practice, however interest has turned to the potential psychological mechanisms eliciting psychological wellbeing.

The current paper builds on previous theory and argues that yoga practice targets transdiagnostic psychological processes; mechanisms that feature commonly across a wide range of presentations, thus reducing distress and increasing wellbeing across clinical and non-clinical populations. Features of yoga practice are discussed in relation to these transdiagnostic processes and the features of modern talking therapies. A new model is proposed positing specific aspects of yoga practice correlate with specific transdiagnostic processes to elicit psychological change and argues that the mechanisms by which change occurs are directly compared with the changes observed in talking therapies. The implications for future research and the potential for this to support the commissioning of holistic approaches in clinical practice are discussed.

1. Introduction

Treatment for mental health difficulties in the UK is provided free of charge by the National Health Service (NHS), with the two most common forms of intervention offered being psychiatric medication or talking therapies [1]. Whilst talking therapies have a good evidence base, rates of remission and relapse are still relatively high [2,3] and not everyone experiencing distress will seek help. Salaheddin and Mason [4] investigated barriers to seeking help for mental health difficulties, and found stigmatizing beliefs and difficulties identifying or expressing concerns as two factors contributing to not seeking help. It could be argued that talking therapies, which are typically focused upon detailed discussion of one's inner experiences, may consequently act as a deterrent to help-seeking for those not wishing to discuss their experiences due to fear of negative judgement, shame, or those simply unable to express their experiences in words. Though creative therapies (which involve engaging in music or art without necessarily an expectation of detailed discussion) may offer one alternative for those not wishing to take medication or engage in talking therapies, these are not always widely available on the NHS and typically still involve discussion of one's experiences [1,5]. Furthermore, these approaches are often considered adjunctive to, rather than instead of, medical or talking

interventions.

Other holistic approaches to psychological wellbeing, sometimes termed "alternative" or "complementary" approaches, typically adopt a biopsychosocial approach and are concerned with global wellbeing as opposed to the treatment of specific symptoms [1]. However, as these approaches can be substantially heterogeneous in their methods and may target facets that are not easily measured by observation or self-report tools (e.g. spirituality), they are not often suited to robust scientific investigation on which treatment guidelines are based. Consequently, holistic approaches to mental health do not meet the scientific criterion for best practice guidelines, are not compared against existing approaches in clinical trials, and are not routinely commissioned or delivered in routine care. Thus, the reality is that those experiencing mental health difficulties and requiring free treatment can opt only for medication or talking therapies as a treatment in the UK (and other nations in which robust empirical evidence is necessary for inclusion in practice guidance). Increasing the options available for treatment first requires evidence that holistic approaches can be equally as efficacious to psychological wellbeing as psychiatric medication or talking therapies.

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1.1. Yoga

Yoga practice is one such holistic approach that has grown in popularity in the western world in recent years. One study reported an increase of 16.3 million practitioners in America between 2012 and 2016 [6]. Yoga practice originates in Indian philosophy and has been described as “a set of principles, beliefs, and practises for yoking matter to spirit, body to mind, personal to universal, and mortal to immortal” [7, p.8]. The emphasis is on the connection between mind, body and spirit, and most practices are typically centred around Patanjali’s yoga sutras, a leading text in understanding the process of the yoga journey [8]. The text outlines the “eight limbs” of yoga: yamas (the “laws of life”; [8, p. 56]) or “behaviour patterns” [9, p. 98] that guide our actions; niyamas (the “rules for living”; [8, p. 56]) that guide how we should engage in these actions; asana (“postures”; [8, p.56]); pranayama (breathing exercises; [8,9]); pratyahara (the “retirement of the senses”; [8, p.56]) or process of moving attention inwards [8]; dharana (the focusing of attention exclusively on one subject; [9]; dhyana (“meditation”; [8 p.56]), distinguished from dharana as the point at which the mind connects with, rather than simply observes, the object of dharana [9], and samadhi, the point at which we become one with the object of dharana [9] and achieve a settled mind [8].

The recent emergence of “yoga therapy” has presented a challenge to research investigating yoga’s beneficial effects as there is no unanimous distinction between *therapeutic* yoga (i.e. yoga practice that can yield beneficial effects) and *yoga therapy*. The British Wheel of Yoga [10] have attempted to distinguish yoga therapy as that in which yoga practices are individually tailored with the explicit aim of relieving a physical, mental or spiritual health condition [10], whereas *therapeutic* yoga is considered to not necessarily directly attempt to relieve such symptoms, instead teaching the different elements of yoga [11] and broadly promoting health to all attending [10,11]. However, to date there is no widely accepted distinction of these practices, which poses a problem for the field of yoga research as there is no framework on which to demarcate these interventions.

There is growing evidence for the use of yoga interventions in improving physical and mental health [12,13], with systematic reviews finding support for the use of yoga as an intervention for anxiety [14], depressive symptoms [15], post-traumatic stress disorder (PTSD; [16]), and work-related stress [17]. Additionally, the psychological benefits of engaging in therapeutic yoga practice have recently been demonstrated [18]. However, the literature into yoga interventions for psychological wellbeing is limited by the lack of randomised controlled trials (RCTs) comparing yoga interventions with medical or psychological treatments, and those that are available often employ small samples and assess yoga as an adjunctive treatment to standard care as opposed to a stand-alone intervention (see Ref. [19], for a review of yoga intervention RCTs for mental health). The heterogeneity of yoga interventions on which current evidence is based makes it impossible to establish which aspects of yoga practice may be yielding therapeutic benefit. With a view to overcoming this dilemma, recent tools have been developed to assess the extent to which yoga interventions employ each of the eight limbs of yoga practice (Essential Properties of Yoga Questionnaire [EPYQ, 20] and the extent of engagement in yoga practice (Yoga Immersion Scale [YIS, 21], however these are yet to be used widely in yoga research. Additionally, recent guidance has been developed to improve the reporting of yoga studies (CLARIFY; [22]) and holds potential to support not only replicability of studies but also transparency that would allow a more nuanced and detailed analysis and inference regarding the mechanisms of change from yoga practice.

1.1.1. Psychological mechanisms of change in yoga practice

Evidence investigating mechanisms of change from yoga practice offer preliminary support for the targeting of “transdiagnostic” (TD) processes. TD processes refer to a process or processes that are non-specific to diagnoses and are implicated across a spectrum of

psychological distress. They may be physiological, psychological (internal and behavioural processes) or interpersonal in nature, and in relation to yoga practice, research has previously focused on the physiological processes affected [12,23,24]. The autonomic nervous system (ANS) and hypothalamic-pituitary-adrenal (HPA) axis in particular have been highlighted as physiological systems affected by yoga practice [25, 26,27].

Harvey et al. [28] conducted interviews with yoga teachers and therapists to explore perceptions of how and why yoga practice may be psychologically beneficial, reporting themes of increased awareness and choice (control), improved relationships with oneself and others, and the emphasis of individuality in yoga practice as potential mechanisms of change. In a cross-sectional study, Tihanyi et al. [29] found mindfulness, body image and satisfaction with body image to mediate the relationship between yoga practice and psychological wellbeing in advanced yoga practitioners. This evidence is limited by geographical homogeneity (both studies conducted in Europe) and a lack of replication, however are consistent in their suggestion that factors of attention and appraisal may be important psychological facets. Though concerned primarily with physical health benefits of yoga practice, a review by McCall [23] further supports this by suggesting self-awareness, control and confidence could all be psychological factors associated with the beneficial effects of yoga practice, in addition to highlighting a number of physiological systems implicated in the experience of psychological distress that are affected. Menezes et al. [13] postulate physiological changes in the endocrine and autonomic nervous systems, and attentional focus, influence immune responses, anxiety and reappraisal respectively, thus resulting in psychological change, however emphasise the lack of research into emotion regulation and yoga practice.

1.1.1.1. Existing models of psychological wellbeing and yoga. Gard et al. [27] propose a self-regulatory model of yoga and psychological wellbeing, based upon a breadth of empirical evidence and encompassing cognitive, emotional and behavioural factors (in addition to physiological mechanisms) as potential agents of change in yoga practice. They propose psychological benefits arise from an improvement in self-regulation of cognition, emotion, and behaviours as a result of yoga affecting attention, self-awareness, the ability to de-centre, reappraise and observe without judgement ones’ experiences (in combination with a variety of physiological processes). For simplicity, the model condenses the eight limbs of yoga into four core features (ethics, breath control, sustained postures, and meditation), however this is at the expense of postulation as to which specific limbs, particularly the yamas and niyamas, may relate to which specific processes. However, the model does propose specific links between ahimsa, santosha and self-compassion, and meditative practices with improved attention. Additionally, the model does not consider how yoga practises may hold potential for contraindications to psychological wellbeing. Though it is acknowledged modern mindfulness-based talking therapies may also target self-regulation, commonalities in the processes affected in yoga and these therapies are not explored, and thus the model makes no prediction as to how yoga interventions may be adapted for comparison with talking therapies.

Kishida et al. [30] present a model focusing on intra and interpersonal changes that arise from yoga practice. Employing the condensed, four-facet core from Gard et al. [27], they suggest wellbeing improves with yoga practice as a result of changes in self-compassion, compassion to others, social connectedness and mindfulness, with individual and social factors moderating the impact on wellbeing. Though they specifically consider ahimsa in their model, they similarly do not postulate how other specific limbs may relate to intra and interpersonal factors.

Taken together, models considering TD processes and yoga practice do exist, both of which stipulate a duration-dose response on wellbeing and highlight ahimsa as an ethical principle of particular interest. However, other than this, they do not make clear predictions regarding

which specific limbs may relate to specific processes and as a result, it is not possible to extrapolate how yoga interventions may be compared with talking therapies with the aim of developing the evidence base for yoga as an intervention for psychological distress.

1.1.2. Summary

Though literature proposing mechanisms of change for the psychological benefits of yoga practice exist, there has been little empirical evidence supporting these to date; an endeavour that is further complicated by a lack of theories linking specific practices with specific psychological processes, and only recent emergence of measures to assess which aspects of yoga practice are incorporated into the yoga interventions under investigation. Further research is necessary to establish which practices are effective for who [18,24,31] and for this, advanced theoretical understanding of which aspects of yoga practices relate to which psychological processes is required.

1.2. Aims of the current paper

This paper has four primary aims:

1. To outline the role of TD processes in the experience of psychological distress
2. To conceptually link these TD processes to specific components of yoga practice
3. To consider how the eight limbs of yoga may be paralleled in the practice and ethos of modern talking theories, and
4. To build upon previous models of mechanisms of change in yoga practice and present a novel, biopsychosocial model that links specific yogic practices with specific TD processes.

Whilst “third wave” talking therapies are explicit in the influence of eastern practices in their development (Compassion Focused Therapy [CFT, 32]; Dialectical Behaviour Therapy [DBT, 33]) or correlates in their philosophical approach to distress (Acceptance & Commitment Therapy [ACT, 34]), this is the first paper to address how specific TD processes may be targeted through both yoga practice and third wave therapies, and to express the explicit hypothesis that the psychological benefit from both practices are the result of a *shared* mechanism of change; one (or multiple) that can be assessed using existing standardised measures *insert footnote 1 here*. Thus, yoga as an intervention for mental health can be investigated using scientifically robust methodology and compared with existing psychological interventions for mental health. The author argues that the psychological benefits of yoga practice should be assessed on the same factors as third wave talking therapies, allowing the therapeutic effects and mechanisms of change to be directly compared, and that this investigation would yield clinical implications for the provision of mental health services above and beyond the medicines and talking therapies currently privileged in western societies.

2. Theory: transdiagnostic processes in psychological distress

The term “psychological distress” has been defined as “*a set of painful mental and physical symptoms*” that can be applied to common human experience, as well as to those that may constitute classification of a mental health condition such as depression [28,32]. For the purposes of the paper henceforth, the term “psychological distress” will be employed to encompass clinical levels of psychological distress (i.e. mental health presentations) as well as the distress experienced in populations without a specific mental health diagnosis (e.g. work-based stress, general population). Conversely, the term “psychological wellbeing” will be used to encompass the absence of, or reduction in, psychological distress, or the presence of positively valenced affect or functioning.

2.1. Psychological processes

2.1.1. Emotion regulation

Emotion regulation is subject to multiple definitions in the literature, however common factors in these models has recently been acknowledged [33]. The individual understanding and acceptance of emotions, and attitudes and responses toward them (typically termed “strategies” or “techniques”) feature across a range of competing models of emotion regulation [33]. Thus, broadly speaking, emotion regulation can be defined as an awareness, acceptance, understanding and response to emotional experience, however the literature faces a similar critique in that competing definitions result in the employment of different measures, compromising a synthesis of the evidence. However, regardless of definition, emotion regulation has widely been postulated as a TD process [34].

The multi-dimensional construct proposed by Gratz and Roemer [35] highlights the awareness, understanding and acceptance of emotional experiences as an adaptive emotion regulatory technique contrary to the experience of psychological distress. Research into maladaptive regulatory strategies (ways of coping that increase or maintain psychological distress) has implicated rumination and experiential avoidance as two key emotion regulation strategies that function in the experience of psychological distress. Rumination has been defined as the process of “*obsessional thinking involving excessive, repetitive thoughts or themes that interfere with other forms of mental activity*” [36] and has been implicated in the experience of psychological distress and wellbeing [37,38]. Experiential avoidance, defined as “*the phenomenon that occurs when a person is unwilling to remain in contact with particular private experiences (e.g. bodily sensations, emotions, thoughts, memories, behavioral predispositions) and takes steps to alter the form or frequency of these events and the contexts that occasion them*” [48, p.1155], has been demonstrated as a risk factor in the development of psychiatric disorders [39,40] and shown to counter-intuitively increase frequency of distressing symptoms [41]. For the purposes of this paper, emotion regulation will be subdivided into two factors pertaining to the cognitive and affective components of emotion regulation (awareness/acceptance), and separately to the behavioural components of emotion regulation (action/coping; inclusive of experiential avoidance and rumination).

2.1.2. Criticism and compassion

Compassion and criticism can be broadly considered opposing approaches to oneself and/or others. The precise definition of compassion has been the subject of debate in psychological literature, however Strauss et al. [42] propose it to comprise five facets spanning cognitive, affective and behavioural components applicable in the relationship to oneself and to others: 1. The recognition of suffering, 2. An appreciation of the universality of suffering (i.e. it is experienced by all), 3. Experiencing empathy for the suffering and connection with the distress, 4. Tolerating adverse feelings triggered by the distress, and 5. A motivation to act to reduce the suffering experienced. Conceptually, this definition is similar to that of Gilbert [43]; “*... a sensitivity to suffering in self and others, with a commitment to try to alleviate and prevent it*” (p. 19) who further emphasises that compassion can flow towards oneself, to others, and from others. Taking these definitions, the practice of compassion involves acknowledging and approaching distress in oneself and/or others with a non-judgmental manner and is thus directly contrary to adopting a self-critical or blaming approach to one’s distress. Accordingly, self-criticism has been commonly implicated in the experience of psychological distress [44], whereas compassion has been associated with reduced psychological distress [45]. Lower levels of compassion toward the self (self-compassion) have been consistently implicated in the experience of psychological distress [46], however compassion towards and from others, a central tenet in the model of compassion by Gilbert [47], and their role in psychological wellbeing are less researched in evidence to date. Literature in this area is further limited by competing conceptualisations of compassion (e.g. Refs [42,43,48])

and the associated discrepancy in measures used to assess these constructs.

2.1.3. Cognitive fusion

Cognitive fusion has been described as “*responding as if private events are true*” [49], p.4688 and is associated with a reduced capacity to step back or to separate from internal experiences. Cognitive fusion has consistently been implicated in the experience of psychological distress [49,50].

2.1.4. Imagery

Mental imagery, or “*a mental representation that occurs without the need for sensory input*” [51], p. 2] has an evidenced relationship to both psychological wellbeing and psychological distress, dependent on the valence of the content. Negatively valenced mental imagery (e.g. a distressing or threat-orientated image) has been implicated in a range of mental health presentations [52] and shown experimentally to increase negative affect [53,54] and reduce positive affect [54]. Conversely, positively valenced imagery (typically capturing security, safety or compassion) has been shown to reduce negative affect and increase positive affect [54].

2.1.5. Attention

The concept of attention is complex, with various models and sub-systems of attention proposed [55]. Racer & Dishon [55] define attention as “... *the set of processes that allow us to process certain information to the (relative) exclusion of other information.*” (p. 2), and present a breadth of evidence supporting attention, in some form, as a TD factor in psychological wellbeing. Mindfulness practice is a central feature of third wave approaches [56] and has been defined as “... *awareness that arises through paying attention, on purpose, in the present moment, non-judgmentally.*” [60, p.4]. Taking this definition, it has been argued that mindfulness practice is concerned with attentional processes [57]. Mindfulness interventions have demonstrated a wide variety of psychological benefits [58], however a recent meta-analysis found mindfulness-based interventions did not directly affect attentional processes [59], suggesting the beneficial effects of mindfulness may not be mechanised by an impact on attention as previously thought. However, due to the complexity in conceptualisation and breadth of attentional processes under research, and the considerable heterogeneity of mindfulness-based interventions [59], the evidence into attention and its role in psychological wellbeing is difficult to synthesise.

2.1.6. Interoception

Interoception refers to the process of the “*awareness, interpretation and integration of sensations in the body*” [64, p. 1894], and thus shares conceptual overlap with the awareness of emotional states central to emotion regulation and compassion. Deficits in interoceptive functioning have been associated with a range of psychiatric disorders characterised by distress [60,61], whereas awareness of internal sensations has been associated with adaptive emotion regulation strategies [60]. However, research into the relationship between emotional processing (and consequent distress vs wellbeing) and interoception is limited by methodological flaws, particularly in relation to the conceptualisation and measurement of interoception [62].

2.2. Physiological processes

Sleep [63,64], the endocrine and nervous systems [23,65], and exercise [66] have been implicated in the experience of psychological distress, however the interplay between these and psychological and interpersonal factors is not yet clearly understood, and there is considerable heterogeneity in the specific factors and outcomes investigated.

2.3. Interpersonal processes

The study of humankind has long recognised our species as social beings [67], thus it is intuitive that the nature and quality of our interpersonal relationships are related to our psychological wellbeing. Interpersonal difficulties have been linked with the experience of psychological distress [68] and third-wave therapies targeting interpersonal style have demonstrated reductions in psychological distress (e.g. Ref. [69]). However, similarly to other TD factors, the evidence into the role of interpersonal factors in psychological distress is limited by opposing theoretical conceptualisation and consequent measurement [68], and as a treatment target this is rarely analysed separately from other intervention processes.

2.4. Biopsychosocial nature of psychological distress

The nature of psychological distress and the juxtaposing experience of psychological wellbeing are complex, and there are evidenced and hypothesised intra and inter domain links between psychological, physiological and interpersonal facets of functioning. For example, interoception involves an attendance to cues of one's emotional state [60] and emotional processing [62], and thus conceptually links to constructs of attention, emotion regulation, compassion and imagery. Self-criticism is a form of responding to oneself in relation to one's experience, and thus links with emotion regulation strategies as well as compassion, and may take the form of derogatory or pejorative mental imagery of the self. Similarly, within physiological TD processes, there are links between the ANS, respiratory and endocrine systems [70], and the endocrine system and sleep functioning [70]. Within interpersonal processes, it is broadly accepted that one's actions will impact others' interpersonal actions, which then in turn influence our own actions (and so on ...); interpersonal processes thus inherently possess a reciprocal nature in that they are shaped by, and shape others, through each interpersonal experience one has. For example, if one demonstrates compassionate action to another, the other may demonstrate cues of social safety in response, which in turn evokes a sense of social safety in the originator. Thus, within any one of these domains, the status of one factor is likely to link with the status of another (e.g. emotion regulation will likely link to interoception etc.).

In a similar manner, inter-domains links have been postulated. Porges [71] argues that constructs such as compassion that are typically conceptualised as psychological constructs cannot and should not be measured independently from their associated physiological states, postulating in his Polyvagal Theory (PVT) that the vagus nerve (part of the ANS) is central to the relationship between mind-body experience, and that this is explicitly linked with emotional experience and interpersonal behaviours. This is supported in psychological models of compassion, for example Gilbert's [43] three flows of compassion highlights the link between showing compassion to ourselves (a psychological construct), compassion to others and receiving compassion from others (interpersonal constructs). Polyvagal theory further postulates links between how our emotional experiences influence our interpersonal functioning and how interpersonal interactions shape our physiological and emotional responses [72]. Physiological and interpersonal factors also feature in psychological models of emotion regulation [33,73] and compassion [47], as well as in formulation models used to guide psychological therapies (e.g. CBT model of perpetuating factors; [74]). Thus, existing theoretical models support the notion that targeting change in one of these domains (physiological, psychological or interpersonal) will effect change in the other two domains, however the *primary* mechanism of change differs dependent on the intervention.

Empirical support for relationships between these domains has emerged in recent years. Kim et al. [75] demonstrate differential areas of brain activation and increased parasympathetic activation when employing compassionate imagery compared to neutral imagery, supporting the notion that fostering compassion impacts physiological

functioning. A recent investigation by Kirschner et al. [76] found the rehearsal of self-compassion simultaneously activated the PNS and reduced physiological arousal; a physiological state that has been associated with psychological wellbeing [76]. Marshall et al. [77] demonstrate change in physiological markers of stress following meditative yoga (posited here to be a primarily psychological component of yoga practice), whilst conversely, and demonstrating the bidirectional relationship between domains, stimulation of the vagus nerve (physiological intervention) has been shown to impact interspersive accuracy [78]. Gerhardt [79] summarises the stark evidence for how early interpersonal experiences impact psychological, physiological and interpersonal functioning.

The bidirectional relationship between these domains is complex; Fig. 1 displays the known and hypothesised relationships between facets of these domains to date. It is counterintuitive and impracticable to attempt to completely distinguish physiological, interpersonal and psychological components of psychological distress and wellbeing. However, due to the focus in existing literature on physiological factors associated with yoga practice, the emphasis in this paper is on psychological and interpersonal processes, with the assumption that these will intrinsically link with physiological features of yoga practice that are well documented by Gard et al. [27]. Thus, it is assumed that yoga practices that are evidenced to impact physiological facets will also have secondary effects in the psychological and interpersonal domains.

3. Talking therapies and yoga practice

3.1. Theoretical underpinnings

Though it will be argued there are similarities in the practices employed in yoga and third wave approaches, the theoretical underpinning determining why each practice is utilised differs. Yoga theory

proposes that suffering is a result of the consistent internal narrative of the mind [80], fluctuations of the mind and disconnection from our “true nature” [8]. Thus, “treatment” (yoga intervention) should be concerned with stilling the mind, reconnecting with one’s true self and achieving enlightenment [8].

Traditional cognitive-behavioural talking therapies are founded on the hypothesis that distortions or perceptual biases in a person’s cognitions are the source of psychological distress [81], thus addressing these relieves the experience of distress. However, third-wave approaches increasingly recognise the physiological correlates of emotional distress and conceptualise emotional distress as a typical feature of human experience. The aim of these talking therapies is to increase psychological wellbeing rather than to still the mind, connect with one’s true self or seek enlightenment, although there is arguably some conceptual overlap. In ACT, the practices in treatment are rehearsed with the aim of increasing psychological flexibility and reducing experiential avoidance [82], in DBT to increase behaviours to regulate emotion, cognition, behaviour and interpersonal factors [83], and in CFT to increase compassion toward the self and others and openness to compassion from others (the “three flows” of compassion; Gilbert, [43]); each of these treatment targets may involve a stilling of the mind (e.g. through quieting self-critical talk) or lead to a more developed understanding of the self that could be conceptualised as connecting with one’s true self or developing enlightenment.

The similarities in the practices employed across these four interventions suggests that, despite the differing rationales, there is some conceptual overlap in the mechanisms underpinning the beneficial psychological effects of yoga practice, ACT, DBT and CFT. Further understanding these mechanisms could facilitate the theoretical understanding of psychological distress, to provide a platform from which to compare talking therapies with yoga as an intervention, and potentially broaden the range of approaches to psychological wellbeing available to

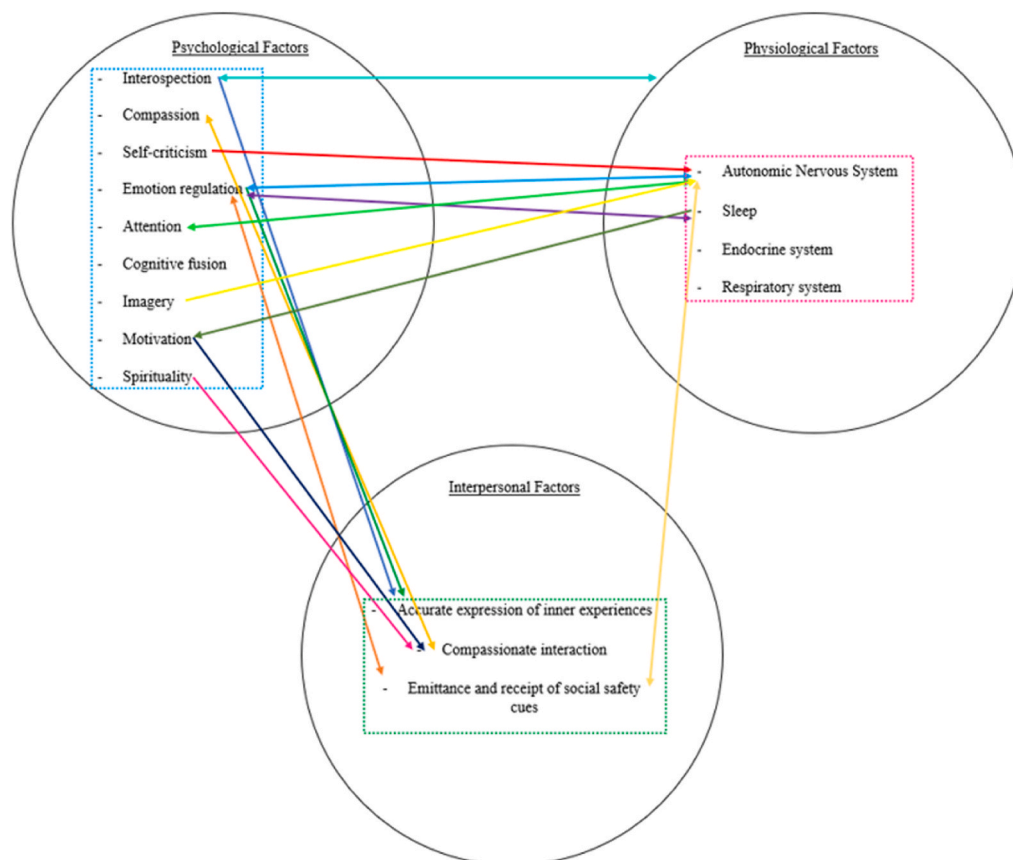


Fig. 1. Evidenced and hypothesised links between psychological, physiological and interpersonal processes related to yoga practice.

both general and clinical populations.

3.2. Broad comparators between yoga practice and third wave talking therapies

The therapeutic relationship between teacher or therapist and the individual is emphasised in yoga practice [9,12,28], DBT [83], CFT [84] and ACT [85], with individuality and the needs of the client the primary guiding feature in each intervention [9,85]. Though yoga is explicitly a mind-body intervention, the physiology of emotions, importance of attendance to physical health, and use of biofeedback are also crucial components of third-wave therapies [47,83]. The aim of both yoga and third wave therapies is to reduce suffering and bring about change, with acceptance and non-judgmental observation of the self the central tenets of each intervention [9,47,83,85].

4. Theory: transdiagnostic processes, third wave therapies and the eight limbs of yoga

The eight limbs of yoga, it is argued here, have undeniable relevance to the TD processes implicated in psychological distress and wellbeing which are the processes targeted in third wave therapies. Table 1 outlines the proposed comparative components of yoga practice with TD processes implicated in psychological distress and wellbeing.

4.1. Yamas

The five yamas of yoga concern ethical behaviour, applied to interpersonal relationships with others and with ourselves [9,80].

4.1.1. Ahimsa

Often referred to as “non-violence”, observing ahimsa means “... kindness, friendliness, and thoughtful consideration of other people and things ... Ahimsa also means acting in kindness toward ourselves” [9, p.98]. A self-critical or blaming approach to oneself, common in the experience of psychological distress [44] is thus directly contrary to the practise of ahimsa. The process of responding to internal experiences (within self and others) and acting with kindness toward them that is advocated for in the observance of ahimsa are directly comparable with the definition of compassion by Strauss et al. [42] and with the three flows of compassion as postulated by Gilbert [47]. The valence of one’s mental images may be conducive to or contrary to ahimsa dependent on the content, though one would hypothesise imagery congruent with the concept of ahimsa to be associated with psychological wellbeing rather than distress. Evidence from interventions designed to increase compassion and reduce self-criticism (as would be expected from the rehearsal of ahimsa) have consistently shown an improvement in levels of psychological distress [86], and emerging evidence suggests yoga practice may improve levels of self-compassion [87].

With relation to evidence-based talking therapies, Adele [88] emphasises the importance of observing this yama in relationships to others and with ourselves; this is directly comparable to the three flows of compassion in CFT, the central tenet of which is the fostering of compassion in relationship to ourselves, to others, and from others, on an individual and sociocultural level [47]. DBT specifies “self-hate, self-blame and sense of shame” as a direct treatment target [33, p. 160], and the emphasis on validation in DBT (responding to one’s experiences as understandable as opposed to shameful; [83]), and on self-acceptance and opening up to one’s experiences in ACT [85] can be conceptualised as practising ahimsa in one’s relationship to oneself. It is argued here that the process of fostering acceptance and compassion towards the self and others, and the reduction of self-criticism that is central to all third wave therapies, is equivalently achieved by the observing of ahimsa in yoga practice.

Table 1

Breakdown of Transdiagnostic Processes and Proposed Associated Yoga Limb.

Yoga limb		Relevant Transdiagnostic process (TDP)
Yamas	Ahimsa	Compassion Self-criticism (opposing) Imagery
	Satya	Emotion regulation (awareness/ acceptance) Interoception
	Asteya	Emotion regulation (awareness/ acceptance and action/coping) Interoception
	Brahmacharya	Emotion regulation (action/ coping) Sleep
	Aparigraha	Cognitive fusion (opposing) Emotion regulation (action/ coping) Compassion Imagery
	Niyamas	
	Saucha	Compassion Emotion regulation (awareness/ acceptance and action/coping) Interoception
	Santosha	Emotion regulation (awareness/ acceptance and action/coping) Cognitive fusion (opposing) Compassion Interoception
	Tapas	Motivation Frequency markers of other TDPs
	Svadyaya	Emotion regulation (awareness/ acceptance and action/coping) Compassion Interoception
	Isvara pranidhana	Emotion regulation (awareness/ acceptance) Physiological systems* Interoception Sleep Interpersonal factors Imagery
Asana		Physiological systems* Interoception Sleep Interpersonal factors Imagery
Pranayama		Physiological systems* Interoception Emotion regulation (awareness/ acceptance and action/coping) Sleep Cognitive fusion Interpersonal factors Interoception Imagery Attention Compassion Emotion regulation (awareness/ acceptance) Compassion Sleep Emotion regulation (awareness/ acceptance)
“Meditation” (pratyahara, dharana, dhyana)		Interoception Imagery Attention Compassion Emotion regulation (awareness/ acceptance) Compassion Sleep Emotion regulation (awareness/ acceptance)
Samadhi		Compassion Sleep Emotion regulation (awareness/ acceptance)

*referring to physiological systems previously ascertained to be associated with psychological wellness/distress.

4.1.2. Satya

Satya has been translated as truth and integrity in all aspects and relationships in life [88], thus acting with satya is acting in direct opposition to experiential avoidance and emotion regulation; by avoiding one’s internal experiences, one is by very nature not being truthful to them nor the present state. It follows thus that one could not move towards awareness, acceptance nor true expression of the internal state if it is denied acknowledgement or experience in the first place. Consequently, one would expect increased observance of satya to relate to improved interoception, emotion regulation (awareness/acceptance)

and reduced levels of experiential avoidance. Emerging quantitative evidence suggests yoga practice may indeed decrease experiential avoidance [89] and has been shown to improve emotion regulation to a greater extent than regular physical exercise alone [90] in line with this hypothesis. Additionally, body awareness has been showed to be positively associated with frequency of yoga practice, psychological well-being and mindfulness in advanced yoga practicers [29], suggesting yoga may be connected with interoceptive abilities.

Satya is perhaps most explicitly related to the interpersonal effectiveness skills in DBT, which serve to enable the individual to communicate emotions, needs, and perspectives in a way that is accurate of the situation and their internal experiences [83]. This therefore requires individuals to be truthful not only with others but also with themselves regarding their thoughts, feelings and needs, so that they are able to truly be acting with integrity in their communications; an observance that is highlighted in the yama of satya [88]. Being truthful with oneself is also integral to the concepts of acceptance (of oneself and one's experiences) and of getting to knowing one's true values that are central to ACT [85].

4.1.3. Asteya

Asteya also encompasses concepts of integrity and reciprocity in relationships [88]. The central notion is one of "non-stealing" [8, p.60], which includes taking from ourselves as well as from others [88]. Thus, the observance of asteya not only applies to the criminal act of stealing physical possessions, though also to the stealing of experiences and emotion. Asteya is thus contrary to experiential avoidance (through not denying one's inner experiences) and is also likely to impact interpersonal interactions; not only by not taking others physical possessions, though also by not stealing emotions and experiences from others (e.g. acting to take away another's happiness). Emotion regulation, compassion and interoception are conceptually linked through the need to be aware of and accept one's (and others) internal experiences before one can inhibit the actions that may intentionally, or unintentionally, take away these experiences. Thus, one would expect lower levels of experiential avoidance, greater emotion regulation (awareness/acceptance) and compassion, and improved interpersonal skills from the practice of yoga inclusive of asteya. Preliminary evidence relating to emotion regulation and experiential avoidance have been discussed, and there is emerging evidence to support the hypothesis that yoga positively influences interpersonal relationships [30], however this is an area considerably lacking in research to date.

The key principle of validation in DBT specifies that emotional responses are not discounted or trivialized [83] and committed action in ACT could be considered in the service of not withholding happiness from the future self. Both therapies could thus potentially promote the observing of asteya in the relationship to oneself. Stealing from others would be conceptualised as a quality-of-life interfering behaviour and thus a treatment target in DBT, and the encouragement of the observing and acceptance of inner experiences in all three therapeutic modalities could be argued as the practice of asteya to oneself: through nature of not dismissing, denying or suppressing one's true inner experiences and behaving towards others in a similar way.

4.1.4. Brahmacharya

Brahmacharya is concerned with the regulation of energy, ceasing of overindulgence and a responsible use of resources [88]. TD processes of sleep and action/coping emotion regulation practices are arguably most relevant to energy use, sleep with a restorative function and rumination and experiential avoidance as an ineffective use of energy resources. If brahmacharya were targeting these TD processes, it would be expected that increased yoga practice would improve sleep (duration and/or quality) and decrease engagement in ineffective regulation techniques, and in support of these hypotheses, yoga practice has been demonstrated to improve sleep [91] and decrease rumination compared to a waitlist control, though interestingly not compared with an aerobic exercise

control, suggesting this may be the result of a shared mechanism between yoga and other physical practices [92].

Emotion regulation skills taught in DBT serve the explicit function of learning to regulate one's emotional energies. In particular, the PLEASE skill [73] is concerned with the regulation of energy through moderating the intake of substances (food and mind-altering) and balancing this with the output of energy (sleep, exercise etc.). The identification of values and committing action to valued living in ACT [85] serve to promote the appropriate (rather than excessive or absence) apportioning of energy to life activity.

4.1.5. Aparigraha

Aparigraha is concerned with "non-possessiveness" and the ability to let go; of situations, physical possessions, and of inner experiences such as thought [88], and links with the concept of de-centring posited by Gard et al. [27] to mechanise psychological change. A central tenet of both compassion and emotion regulation is the response to internal experiences (which may include intrusive mental imagery), that which it is argued here is the first step in the process of then letting these experiences pass. Thus, rehearsal of aparigraha should be related to levels of compassion and emotion regulation (awareness/acceptance) skills. Cognitive fusion can be conceptualised as an extreme possessiveness of an experience, to the extent that one becomes fused with the experience and thus unable to separate or relinquish possession of the experience. The practice of aparigraha is thus contrary to cognitive fusion, and it would be expected that following yoga practice cognitive fusion would decrease and cognitive defusion increase. It follows that psychological distress resulting from internal experiences such as self-criticism or distressing imagery would also decrease, as these experiences would not be held with such conviction. However, to the knowledge of the author, cognitive fusion has not yet been investigated in relation to yoga practice.

Each third-wave modality inspires this yama through the rehearsal of mindfulness, in order to foster non-attachment to harmful urges, self-criticism, and emotional experiences. In ACT, non-attachment to the present moment is most explicit in the practice of defusion techniques that serve to distance oneself from inner experiences and to cease holding them necessarily as "truths" [85]. The use of mindfulness in DBT also promotes the observation and letting go of our thoughts and feelings in addition to change techniques that serve to counter any possessiveness of past ways of coping [73].

4.2. Niyamas

The niyamas are concerned solely with the relationship to ourselves [80] and reflect concepts that are developed and strengthened over time through yoga practice [8]. Thus, the duration of and immersion within yoga practice would be hypothesised to predict the presence of these patterns in yoga practitioners.

4.2.1. Saucha

Translated as "cleanliness" [8,9] or "purity" [88], saucha is concerned with the state of our mind and inner world as [8,9,88], and the purity in the relationship to something, including our relationships to ourselves. Purity involves honesty and forgiveness [88] and thus is contrary to holding a highly critical self-dialogue though congruent to self-compassion. Similarly, to the yamas of ahimsa, satya and asteya, this concept is concerned with open and honest connection with our internal worlds, comparable to TD processes of compassion (toward the self), emotion regulation (awareness/acceptance), interoception, and emotion regulation (action/coping) in the form of experiential avoidance as an opposing factor. Observance of saucha should result in improved self-compassion, interoception and emotion regulation, and decreased levels of experiential avoidance (preliminary evidence for these hypotheses already discussed).

Though the concept of physical purity is evident in the third wave

approaches (e.g. PLEASE skill in DBT; valued living in ACT; treating the body with compassion in CFT), it is more prudent to compare this *niyama* with the self-self and self-other relationships in therapy. DBT encourages this *niyama* through the observation and describing of inner experiences, truthful and respectful expression using interpersonal skills, and acceptance of oneself and the situation as it truly is [83], whereas the concepts of compassion to self and others in CFT promotes an understanding, acceptance and kindness toward oneself and others [47]. Additionally, ACT involves the identification of one's true values, a process that requires an honest reflection on one's true desires and intentions [85]. It is argued here, all are achieving *saucha* in the relationship to oneself, others and the world around them through the practice of these therapeutic modalities.

4.2.2. Santosha

Santosha is "*contentment ... the equanimity that sees things as they are*" [8, p. 63], and the ability to "*accept what happens*" [9, p.101] and to "*unhook*" from emotional disturbance [88]. The concept of acceptance, or "*willing acknowledgement of validity or correctness*" [93] is contrary to the concepts of experiential avoidance and cognitive fusion yet conducive to constructs of interoception, acceptance/awareness emotion regulation practices and compassion. Thus, if one were observing *santosha*, and thus accepting one's inner experiences without struggle, criticism or avoidance, it would be expected that interceptive abilities and the acceptance/awareness facet of emotion regulation and compassion would improve, as levels of cognitive fusion and experiential avoidance decrease. As discussed, experimental investigation of each of these hypotheses is not yet explored in yoga interventions, though the preliminary evidence has been previously discussed.

The concept of acceptance; of thoughts, emotions, situations, others, is a central tenet running through every third-wave talking therapy [56], primarily evoked through the practice of mindfulness meditations (see 3.5 below).

4.2.3. Tapas

Adele [88] conceptualises *tapas* as self-discipline, comprising tolerance that facilitates transformation. This *niyama* highlights that change requires determination, regular practice and conscious decision-making, and thus is associated with habitual action and motivation to engage in activities. In relation to TD processes, this may be more complex to assess than other *yamas* and *niyamas* as it is arguably comparable to both the frequency in which one engages in a particular process (e.g. rumination or self-critical appraisal) though also one's motivation to engage with an action (e.g. positive-self affirmations or compassionate imagery rehearsal). In investigating this construct in yoga intervention, researchers could consider the measurement of the frequency or duration of TD processes, engagement in change behaviours (e.g. cognitive defusion rehearsal) or attendance at intervention (i.e. attrition). One meta-analysis of yoga intervention found drop-out rates to be comparable to treatment as usual and psychological intervention groups, suggesting motivation to engage with yoga interventions acceptable for further investigation [94], however, as the conceptualisation of *tapas* could vary (as described here), measurement of *tapas* in interventions requires further exploration.

It is argued that *tapas* pervade all psychological therapies championing change and action; ACT, CFT and DBT all require rehearsal within and between sessions, regular attendance at appointments and motivation to change. ACT and DBT further emphasise opportunities for action in the use of choice points, committed action and wise mind (ACT; [95], & DBT; [83]).

4.2.4. Svadhyaya

The "... study conducive to self-knowledge" [8, p. 64], inclusive of one's habits, thoughts and behaviours [88], and arguably to one's physiological states and experiences. In a similar manner to the *yamas* of *satya* and *asteya*, the observance of *svadhyaya* is in juxtaposition to the

TD process of experiential avoidance as defined by Hayes et al. [82]. In order to observe one's habits, thoughts and behaviours, one first has to foster motivation to confront these patterns, and to then observe them without attempt to alter, avoid or misrepresent these experiences. Practised with the *yama* principles in mind, *svadhyaya* encourages the exploration of oneself with an honest and non-judgmental curiosity. Therefore, it is hypothesised that increased rehearsal of *svadhyaya* (crucially practised with observance of *ahimsa*, *satya* and *asteya*) would target TD processes of interoception, compassion and emotion regulation (awareness/acceptance, and action/coping), through increased observance and awareness of one's inner experiences.

The study of oneself is undeniably the primary focus of all talking therapies. However, this is explicitly stipulated in ACT; via the exploration of values and the reduction of experiential avoidance [85], in DBT through increased emotional experiencing and chain analyses in order to inform change or acceptance [83], and in CFT via the emphasis on self-awareness and self-study [47].

4.2.5. Isvara pranidhana

The final *niyama* is concerned with "surrender" [88] and "devotion" [96]; to the divine and one's higher purpose through relinquishing the ego and concern with the self [80]. Though yoga is not a religious practice in itself [27], this may pertain to specific spiritual or religious beliefs of the individual engaging in yoga practice (i.e. if one follows specific religious or spiritual teachings). Spiritual beliefs have been suggested to be a psychological resource in resilience against psychological distress, though also proposed as an exacerbating factor in some presentations should the beliefs be a significant source of shame or guilt [97]. Dolcos et al. [98] found self-reported religious coping to be positively correlated with reappraisal and negatively correlated with suppression (both strategies of emotion regulation) and psychological distress. Furthermore, they found reappraisal mediated the relationship between religious coping and psychological distress. Taken together, these studies suggest *isvara pranidhana* could impact psychological distress via the TD process of emotion regulation (action/coping).

Though spirituality is not explicitly specifically woven into the third-wave approaches, there are similarities between *isvara pranidhana*, or the mind/soul distinction and the concept of self-as-context within ACT [85]. This postulates that internal experiences be considered as part of a bigger "I" rather than *the* "I" itself, i.e. one's experiences of living form a broader life experience than is the momentary experience itself. Similarly, the mindfulness "observe" skill in DBT is postulated to function as a mechanism for distinguishing an event from the act of observing an event [83], and thus linking with the concept of holding an idea of a "bigger picture" in mind.

4.3. Asana

Asanas are the physical postures of yoga practised with the purpose of strengthening the physical body [8] and preparing the body for the latter limbs of yoga [9]. Arguably, *asana* practice is the most rehearsed aspect of yoga practice in the west [27] and given the physiological nature of the practice there is considerable evidence investigating *asana* practice and physiological factors relating to mental health. A recent meta-analysis found interventions including *asana* practice reduced a range of physiological markers relating to psychological distress compared with controls [99], with the downregulation of the hypothalamic-pituitary-adrenal (HPA) axis and regulation of the ANS most cited [25,26]. Furthermore, yogic theory has proposed *asana* catalyse the release of psychological tension through activation on the physiological underpinnings [100], supporting the notion that physiological changes from *asana* practice would impact psychological well-being via physiological systems.

Whilst there is evidence that "yoga practice", broadly speaking (and frequently inclusive of *asana* practice), may impact TD factors such as self-compassion [87], experiential avoidance [89], emotion regulation

[90,92] and sleep [91], there is little evidence to date investigating the specific contribution of asana practice in isolation of the other limbs of yoga. Franklin et al. [101] found asana practice uniquely predicted a reduction in depressive symptoms in comparison to pranayama and dhyana practice (see sections 3.4 and 3.5), however there was no measure of TD processes that may have been involved in this effect. Given that students should be given alignment cues for each asana [80], and be instructed to notice sensations and movements in the body [100], it is intuitive that asana would be expected to improve interoception.

Kishan [25] postulates that mirroring a teacher's asana in class may trigger mirror neurons involved in social cognition; if this were the case, asana may influence interpersonal factors, however this has not yet been subject to empirical study. Linked with this hypothesis, PVT postulates that the regulation of the ANS is central to social communication and behaviour [102], thus asana have been implicated in the regulation of this system [25], it follows that would one expect changes in interpersonal factors as a result of asana practice via de/activation of the associated physiological processes. Finally, mental imagery of asana is a core feature of this limb [9] and thus may also be related to psychological wellbeing following yoga practice, influenced by whether the imagery is employed positively (e.g. encouragingly held) or negatively (e.g. critically held).

Though the asana of yoga are not typically held in third-wave approaches, physiological processes are clearly incorporated into CFT theory and intervention [47], and there is an emphasis on the positioning of the physical body to explore and promote compassion [47]. Additionally, physical movement as a means of mindfulness is a specific technique used in ACT [85].

4.4. Pranayama

Pranayama refers to exercises of breath regulation, and similarly to asana when taken in isolation of the other limbs (if this is in fact possible), this is a distinctly body-orientated aspect of yoga, and thus likely serves to regulate physiological systems involved in emotional experience, and to increase awareness of one's internal bodily states (interoception). Consistent with this hypothesis, a recent review found yogic breathing to improve cognitive functioning, activate the parasympathetic nervous system (PNS) and deactivate the sympathetic nervous system (SNS), enhance pulmonary function and reduce oxidative stress [103]. Thus, it can be postulated that pranayama practice would be associated with improved emotion regulation, sleep, and interpersonal factors, as the autonomic nervous system has been implicated in the experience of these factors (emotional experience: [104]; sleep: [105]; interpersonal factors: [102]), however this conclusion is compromised by the heterogeneity of pranayama practices which may be targeting different physiological systems, and the lack of measurement of these factors in research to date.

Pranayama in yoga practice serves to facilitate the rebalancing of energies in the physical body. However, in talking therapies breathing practices are rehearsed as skills designed to calm the distress associated with activation of the SNS by activating the PNS. In CFT, soothing rhythm breathing is employed (among other practices) to activate the vagal nerve [106], and in DBT, regulatory breath practices also feature in the distress tolerance skills taught (e.g. TIPP; [73]), likely targeting similar processes.

4.5. "Meditation": Pratyahara, Dharana and Dhyana [27]

Pratyahara, dharana and dhyana are three distinct concepts in yoga practice, however all are concerned with attentional focus. They are not typically taught as individual practices, rather interwoven with the other limbs through the process of attentional focus throughout the practice [27]. Pratyahara is a *state* in which attention is drawn inwards and one meditates upon the internal sensations at the expense of all outer sensory input [9], and thus strongly parallels with the construct of

interoception. Dharana concerns focusing ones' attention exclusively on one point or object [9], and dhyana is a deeper state in which the mind becomes as one, connected with, the object of dhyana [9].

As with other limbs of yoga, these meditative elements, described explicitly as such, have rarely been studied in isolation, however studies exploring "mindfulness" meditation have surged in recent years. Taking the Kabat-Zinn [107] definition, these could be argued as equivocal to the practice of pratyahara or dharana, dependent on the subject of focus [25]. Meta-analyses show these interventions can be effective in improving psychological wellbeing in adults [108,109] and youths [110], although in exploring the effects on attention, the hypothesised mechanism of change [59], found non-significant effects in a recent meta-analysis. All meta-analyses highlight the tremendous heterogeneity of the interventions used, and a further analysis within Im et al. [59] found intervention *type* moderated the effects on attention, with Mindfulness-Based Stress Reduction (MBSR) and Mindfulness-Based Cognitive Therapy (MBCT) demonstrating superior effects. However, interventions described as "yoga" that included some aspect of asana [111] or pranayama [112] have suggested improvements in attention as a result of yogic intervention. Conversano et al. [113] further report an impact of mindfulness interventions on levels of self-compassion, and it has been postulated that mindfulness practice may impact emotion regulation [114] and prosocial behaviours [115]. Should mindfulness exercises have been directed to bodily sensations, one would expect improved interoceptive abilities to also improve. As an alternative hypothesis, it is plausible that mindfulness meditations in which participants are directed to focus on a mental image may affect psychological wellbeing as a result of the valence of the image on which they meditate.

The subtle distinctions in these limbs of yoga, the practices as interwoven with other features of yoga practice, variance in the focus of meditation (internal or external), and the heterogeneity in studies attempting to isolate the impact of meditative practices mean exploration of these practices and the impact on psychological factors remains a challenge to scientific research. However, preliminary evidence suggest these interventions may have positive effects on psychological wellbeing and TD processes of attention and self-compassion, with a potential to impact interoception, emotion regulation and interpersonal factors.

The use of mindfulness pervades all third wave therapies [56], and the specific practices employed would determine which aspect of yogic meditation is relevant, although arguably all mindfulness practices involve the rehearsal of dharana at the very least. The focus of attention (dharana) may be internal (e.g. awareness of the breath), which would involve the simultaneous practise of pratyahara, or external (e.g. to objects or sounds in the person's environment). In yoga practice, internal-orientated meditations are commonplace. The focusing on the breath is one form of meditation [9], and students are explicitly directed to be aware of bodily sensations, thoughts and feelings that arise during yoga practice [100]. The instruction to become aware of internal experiences is persistent in mindfulness practices across the third wave therapies, with participants invited to attend to thoughts, feelings, sensations and urges as well as events in the environment [83,85]. There are multiple breath awareness mindfulness practices in ACT [85], CFT [116,117], and DBT (Hall, 2013; [73]).

The use of mental imagery (particularly visual imagery) is commonly utilised as a focus of dharana in yoga asana [9] and meditation [118], CFT [116,106], ACT [85] and in some DBT mindfulness practices [73, 119]. Given that mental imagery has been shown to have a strong connection to our emotional experience [120], with the content of the imagery crucial to the consequent psychological state [53,54], the specific imagery practices rehearsed in yoga and/or therapy are likely to be important in the resultant level of psychological wellbeing or distress. Furthermore, the content of imagery used in meditation may hold specific parallels with the yamas and niyamas (e.g. loving kindness meditation in CFT and DBT is likely to evoke a sense of ahimsa or compassion), compounding the importance of specificity in research exploring the effects of meditative practices.

4.6. Samadhi

Samadhi describes the complete, aware connection with the object of our attention [9]. When experienced for a prolonged time, this state can refer to a state of heightened consciousness, “bliss” or “enlightenment”, in which there is union between oneself and the universe [121], and is concerned with progression from “I” to “We”, between personal and cosmic consciousness, and between body, mind and spirit [25]. There is a considerable empirical evidence demonstrating a link between psychological wellbeing (or conversely, distress) and spirituality and religiousness [121,122], though each construct alone is multifaceted and thus establishing clear links is a complex task with debate ongoing as to the boundary between spirituality, religion and mental health [122]. Thus, researching this limb in isolation is again inherently problematic, however preliminary evidence suggests spirituality (broadly speaking) may be associated with compassion [123], emotion regulation strategies [124], and sleep [125]. Thus, it could be expected that yoga practice encompassing the experience of samadhi would affect these TD processes.

A core focus of third wave therapies is the exploration of the self and increasing meta-cognition [56], and a sense of enlightenment may be achieved through a variety of practices in addition to the process of meditation (comparable to yoga as outlined above), including values exploration and mindfulness practices to build awareness of the self.

Additionally, the use of formulation, or “a hypothesis about a person’s difficulties, which draws from psychological theory” [127, p.5] is considered both an object and a process within psychological therapy [126], thus this process could also arguably result in the person becoming one with, or enlightened from, the object that is the formulation.

4.7. Summary

There are a number of conceptual links between yoga practice and TD processes implicated in psychological wellbeing and distress. It is argued that the beneficial effects of yoga practice are the result of targeting these TD processes, that are also targeted during third wave intervention, though through rehearsal of the eight limbs of yoga as opposed to skills practice and discussion as in talking therapies. However, conclusions regarding the role of TD processes in the psychological benefit yielded by yoga practice are considerably limited by the lack of any systematic research programmes nor measurement of these processes in the empirical research into yoga, and there is vast heterogeneity in the yogic interventions under investigation. Additionally, there is complexity involved in investigating these factors and their interplay with physiological systems implicated in yoga practice and the experience of psychological distress, which is likely a reciprocal relationship between physiological, psychological and interpersonal processes. A further complicating factor is the dispute in the conceptualisation and

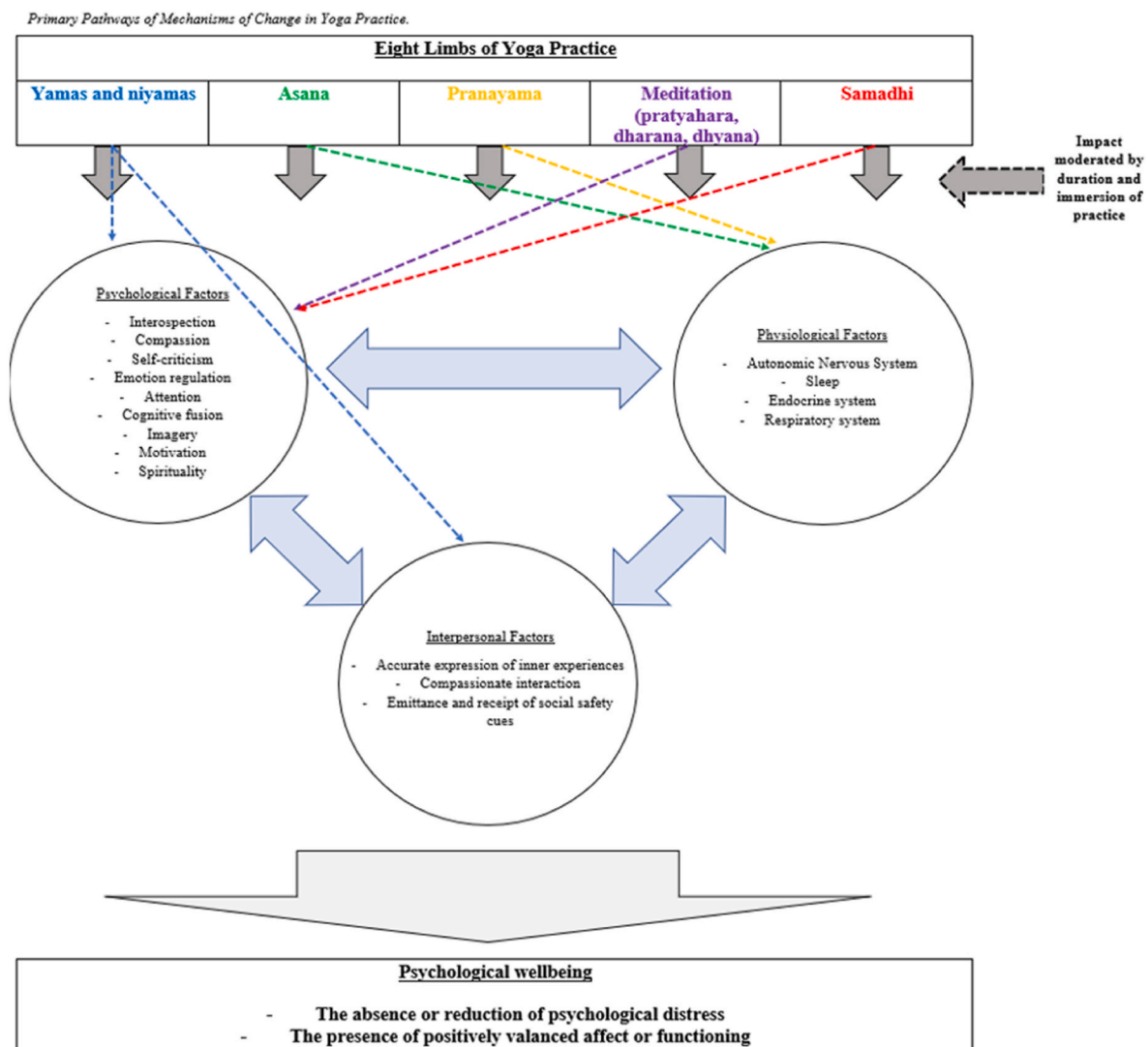


Fig. 2. Primary pathways of mechanisms of change in yoga practice.

consequent measurement of these factors. Nonetheless, these conceptual parallels and the evidence to date suggest TD processes in yoga practice warrant further investigation to inform theoretical and clinical applications of yoga as an intervention for psychological wellbeing. Furthermore, there are clear parallels between practices of third wave therapies and yoga practice, however to date there is no empirical investigation directly comparing the practices of these therapies with those of yoga practice. There are also crucial differences to note, including the starkly contrasting theoretical bases and the extent to which physical movement is incorporated into practice.

5. Calculation. Yoga intervention: A model of transdiagnostic processes

A new model positing TD processes as hypothesised mechanisms of change in yoga practice is displayed in Fig. 2 and predicts a moderating effect of duration and/or immersion in one's yoga practice, and mediating effects of psychological, physiological and interpersonal factors that are primarily targeted through specific limbs of yoga.

As in previous theories [27,30], the model acknowledges the interacting nature of physiological, psychological and interpersonal processes in the role of psychological wellbeing, and postulates that aspects of yoga practice demonstrated to effect one domain will have secondary effects in the other domains (as per yoga theory; [100]), thus eliciting physiological, psychological and interpersonal benefits that impact psychological wellbeing. However, the model hypothesises that each yoga limb mechanises psychological wellbeing through a primary pathway, in which a specific domain (or domains, in the case of yamas and niyamas) is initially targeted that then has secondary effects on the other domains of functioning. Thus, though change in multiple domains may be evident from rehearsal of a single limb such as asana (if this is in fact possible), this is stipulated to be as a result of mechanising shift via the primary pathway. For example, it is hypothesised that physiological changes resulting from meditative practice (e.g. Ref. [75]) are the result of primary changes in psychological factors (for example, self-compassion or attention), and that these effects initiate a secondary effect in the secondary domain (in this case, physiological factors). Alternatively, engagement in asana practice may demonstrate effects in emotion regulation as a result of primary effects in the physiological system (e.g. respiratory functioning) which then impact change in psychological factors (e.g. improved interoception and consequent emotion regulation). Thus, the model supports previous theories proposing top-down and bottom-up mechanisms (e.g. Ref. [27]), however suggests there are primary pathways through which each limb yields psychological benefit.

The model emphasises the yamas and niyamas as particularly relevant to psychological and interpersonal change, and predicts that without incorporation of these limbs, yoga practice would elicit only limited psychological benefit. For example, if the person regularly incorporated the yamas and niyamas in their asana practice, one would expect considerable change in psychological wellbeing that was specifically mediated by psychological constructs, such as improved compassion (to self and others) and emotion regulation (and consequent perception of social safety cues and emotional expression). Conversely, if the yamas and niyamas were not incorporated into the practice, it is plausible that one may not see an improvement (or at least, minimal change) in psychological factors if, for example, the person was not observing ahimsa and continuing to engage in self-critical talk during or after their practice.

6. Discussion

This paper has outlined the theoretical relevance of the eight limbs of yoga to TD processes involved in psychological distress and wellbeing, described how they may be comparably targeted in the practices of third-wave talking therapies, and presented a novel model postulating

specific mediatory effects of each yoga limb as impacting psychological, physiological and interpersonal domains that result in psychological wellbeing. The consideration of the relevant TD processes across each yoga limb provides a foundation for yoga interventions to be directly compared with third wave therapies in which there is conceptual overlap in the hypothesised mechanism of change and component practices. The model requires empirical testing to affirm or disprove the predictions made.

6.1. Critique

A key strength of the model is that it posits clear, testable hypotheses to further the empirical understanding of how yoga practice may yield psychological benefit; namely that specific yogic practices be associated with specific TD processes. The extent to which one engages with each limb (along with immersion in and duration of practice) should thus determine scores on the associated TD process (as outlined in Table 1). For example, the extent to which one engages in the practice of ahimsa should be associated with levels of compassion, self-criticism, and interpersonal factors, whereas regular practise of aparigraha should be associated with lower cognitive fusion and increased awareness and acceptance of emotions.

The model was developed based on intuitive conceptual comparisons and existing theories of the mechanisms of change in yoga practice, and there is preliminary evidence for TD psychological mechanisms being associated with the beneficial effects of yoga practice. Park et al. [127] found that mindfulness, interceptive awareness, spiritual well-being, and self-control, but not self-compassion, increased following a 12-week yoga intervention, and that changes in mindfulness, interceptive awareness, spiritual wellbeing and self-compassion were associated with reductions in stress following the intervention. Additionally, there is emerging evidence for specificity in the eight limbs of yoga and the consequent impact on psychological wellbeing. Franklin et al. [101] analysed the relationship between the duration of experience practising asana, pranayama, and meditation (conceptualised as dhyana only) and a number of measures of psychological distress (anxiety, depression, life stress and overall distress). The duration of experience in the three limbs were highly correlated with one another, however they found differing relationships between experience of each limb and the psychological factors assessed. Duration of pranayama practice negatively correlated with life stress, though not with any other facet of distress, whereas duration of dhyana practice negative correlated with all factors other than depression, although these relationships were not significant when controlling for life stress. Duration of asana, however, negatively correlated with anxiety, depression and overall distress, and these relationships remained significant after controlling for life stress. Furthermore, they found as duration of experience increased, the relationship between life stress and depression reduced. However, the duration of experience with each limb varied, with the mean months' experience highest for asana, followed by dhyana and then pranayama, though whether this difference was significant is not reported upon. Thus, it is possible that a certain duration of experience with each limb, alongside engagement with the limb per se, is necessary before psychological change is elicited. The authors highlight the heterogeneity of asana practices and the associated variance in the physical demand of each type of asana practice, and it is possible that specific asana types may further have differing specific effects on psychological wellbeing [101], a proposition that the current model would support, as different asana may impact physiological systems to a different extent (e.g. power yoga vs. yin yoga). Despite the limitations of the study, the results suggest that each limb may have specific relationships with facets of psychological distress as postulated in the TD model presented here. The beneficial effect of yoga on a range of psychiatric disorders offers further support for the targeting of TD processes in yoga practice [19].

The focus on psychological factors was justified by the relatively little research into mechanisms of change in this domain, however this

is, to some extent, at the loss of a detailed understanding of the physiological factors inherently linked to these psychological factors, though these have been thoroughly discussed in previous models (e.g. Ref. [27]). Similarly, despite acknowledgement of interpersonal factors, the relationship between these, psychological factors and physiological factors requires further detailed consideration than is outlined here and is particularly prudent given the intimate relationship between teacher and student [9] and the group context in which yoga is often practised. Additionally, environmental factors of the yoga practice are not included in the model, though there is some evidence that this should be further explored. Porges [72] suggests music, a common feature of yoga practice, may activate the vagus nerve and thus may also be a contributing factor to psychological wellbeing as a result of yoga practice.

6.2. Research implications

The model presented here lays foundation for a breadth of empirical research into yoga interventions. Future research into yoga and psychological wellbeing should include measures of TD processes hypothesised here to be of relevance to yoga practice (Table 1). The numerous predictions made by the model presented here require empirical testing to further the understanding of which practices primarily relate to which TD processes, and thus which practices are impactful for different facets of psychological wellbeing. Studies combining assessments of the constituent parts of yoga intervention or immersion in the practice with measures of the hypothesised mechanisms of change hold potential for further understanding of which specific practices are beneficial for which aspect of psychological wellbeing, and the mechanisms by which certain practices may elicit these changes.

To further understanding of how physiological, psychological, and interpersonal factors interplay with yoga practice, physiological markers (e.g. heart rate variability) should be investigated alongside self-reporting of psychological factors. Consistent assessment of both psychological and physiological TD processes in response to yoga practice would augment understanding of the complex interplay between these factors.

Studies investigating yoga practice need specificity in the reporting of the intervention to facilitate this understanding and comparison of interventions across studies (see Ref. [128] for an exemplar outline of yogic intervention). Adherence to the CLARIFY reporting guidelines [22] will not only considerably improve the robustness of the evidence base though will also permit inferences regarding specificity of interventions and populations. Systematic research programmes comparing yogis and non-yogis, interventions with the inclusion/exclusion of specific limbs, and different subtypes of each limb (e.g. yin vs. hatha asana, different types of pranayama) will facilitate a theoretical understanding of the relationship between specific yoga practices and TD processes. Consistency in the measures used to assess these constructs and replication studies will bolster the validity of empirical research in this area.

Yoga interventions could be designed to match third-wave therapies in the TD processes targeted, to permit a direct comparison of whether non-talking yoga interventions could be offered as an alternative to talking therapies. For example, one could design yoga interventions that target the postulated mechanisms of change in third wave therapies (ACT: defusion, acceptance, present-moment awareness, values, committed action and self-as-context [129]; CFT: self-reassurance, self-criticism and affect [130]; DBT: mindfulness, interpersonal factors, emotion regulation and commitment [131], by ensuring the inclusion of the relevant limbs in the yoga intervention (see Table 1) and measures to assess these TD processes across treatment. For example, in matching ACT with a yoga intervention, one would ensure the yoga intervention incorporates satya, asteya, aparigraha, saucha, santosha, tapas, svadhyaya and pranayama (postulated to be of particular relevance to cognitive fusion, experiential avoidance, and the common factor of breathing practices), and use measures of psychological

flexibility and experiential avoidance as outcome measures alongside psychological wellbeing. Whereas, in comparing CFT with yoga, the intervention would emphasise ahimsa, aparigraha, saucha, santosha, svadhyaya and meditative practices, and use measures of compassion, interpersonal relationships and self-criticism alongside psychological wellbeing. Designing intervention studies in this way would allow direct comparison of the relevant processes and their associated impact on wellbeing. Studies comparing yoga interventions with third wave therapies that measure change in TD processes could offer valuable theoretical and clinical implications; if efficacy of yoga interventions were evidenced, this would have the potential to support the use of yoga as a holistic approach available in the NHS, which would permit patient choice above and beyond the medical and talking therapies currently offered to those experiencing psychological distress.

The relevance of duration of practice may mean yoga interventions require a longer course of treatment, and this would need consideration in establishing the cost-effectiveness of interventions. Broad indicators of cost effectiveness, such as relapse and remission rates and the potential to reduce secondary costs (e.g. from non-help seeking attempts to regulate distress such as substance misuse) should be considered in these investigations.

6.3. Further considerations

Despite the theoretical potential of yoga to reduced psychological distress via TD processes, contraindications for its therapeutic use should also be considered. Yoga is an integrative approach and interventions should be designed to encourage the balanced observance of the yamas and niyamas to the practice, as without these there is potential for participants to engage with yoga in harmful ways. For example, one pushing their body without observing ahimsa may lead to physical injury or self-critical judgement, one augmenting their observance of ahimsa toward others may do so at the subjugation of their own needs if they do not concurrently observe brahmacharya. Barriers to experiencing a benefit from yoga practice can also be extrapolated from the research into TD processes, for example, barriers to compassion such as fear have been identified and linked with psychological distress [132] and may conceivably also act as a barrier to therapeutic change in yoga practice. Blocks to therapeutic change from yoga practice require further exploration, and the observance of the yamas and niyamas are hypothesised here to be of particular relevance to this. The association between TD processes should also be further explored, for example, how emotion regulation may associate with or influence levels of compassion.

7. Conclusions

Yoga practice has an increasing evidence base for impacting psychological wellbeing and distress, however the psychological mechanisms by which this takes place remain largely unknown due to the emphasis on physiological factors in the literature. A model by which TD processes involved in psychological wellbeing and third wave talking therapies relate to the eight limbs of yoga practice is proposed here. The predictions made by the model permit empirical investigation of how therapeutic benefit may emerge via psychological processes, pertaining to specific limbs of yoga, and allow yoga interventions to be compared with talking therapies via the measurement of these TD processes. Further empirical investigation of the model is required to assess validity of the hypotheses made and to establish whether yoga interventions have the potential to offer a viable alternative to medicinal and talking therapies currently freely available in the UK.

Author statement

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Footnotes

1. Mindfulness-Based Stress Reduction [MBSR], on which Mindfulness-Based Cognitive Therapy [MBCT] was based was discussed by Gard et al. (2014) and so is not explored again here.

Preference for colours

Online only.

Declaration of competing interest

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References

- [1] Mind, Mental health problems – an introduction, 12th January 2021, <http://www.mind.org.uk/information-support/types-of-mental-health-problems/mental-health-problems-introduction/treatment-options/>, 2021.
- [2] S. Ali, L. Rhodes, O. Moreea, D. McMillan, S. Gilbody, C. Leach, M. Luccock, W. Lutz, J. Delgadillo, How durable is the effect of low intensity CBT for depression and anxiety? Remission and relapse in a longitudinal cohort study, *Behav. Res. Ther.* 94 (2017) 1–8, <https://doi.org/10.1016/j.brat.2017.04.006>.
- [3] K.S. Springer, H.C. Levy, D.F. Tolin, Remission in CBT for adult anxiety disorders: a meta-analysis, *Clin. Psychol. Rev.* 61 (2018) 1–8, <https://doi.org/10.1016/j.cpr.2018.03.002>.
- [4] K. Salaheddin, B. Mason, Identifying barriers to mental health help-seeking among young adults in the UK: a cross-sectional survey, *Br. J. Gen. Pract.* 66 (651) (2016) e686–e692, <https://doi.org/10.3399/bjgp16X687313>.
- [5] National Institute for Health and Care Excellence [NICE], Psychosis and schizophrenia in adults: prevention and management (art therapies), 29th June 2021, <https://www.nice.org.uk/guidance/cg178/ifp/chapter/psychological-therapy#arts-therapies>, 2021.
- [6] Yoga Alliance, Yoga in America study conducted by Yoga Journal and Yoga Alliance reveals growth and benefits of the practise, 30th March 2021, <https://www.yogaalliance.org/Portals/0/YIAS%20Press%20Release%20with%20Y%20contact%20info.pdf>, 2016.
- [7] A. Judith, Chakra Yoga, Llewellyn Publications, 2019.
- [8] A. Shearer, The Yoga Sutras of Patanjali, Rider, 2002.
- [9] T.K.V. Desikachar, The heart of yoga: developing a personal practise, *Inner Tradit. Int.* (1995).
- [10] The British Wheel of Yoga, Yoga therapy, 30th March 2021, <https://www.bwy.org.uk/yoga-therapy/>, 2021.
- [11] N.J. Devi, Yoga teaching or yoga therapy, *Int. J. Yoga Ther.* 24 (2014) 9–10.
- [12] R. Bayley-Veloso, P.G. Salmon, Yoga in clinical practise, *Mindfulness* 7 (2016) 308–319, <https://doi.org/10.1007/s12671-015-0449-9>.
- [13] C.B. Menezes, N.R. Dalpiaz, L.G. Kiesow, W. Sperber, J. Hertzberg, A.A. Oliveira, Yoga and emotion regulation: a review of primary psychological outcomes and their physiological correlates, *Psychol. Neurosci.* 8 (1) (2015) 82–101, <https://doi.org/10.1037/h0100353>.
- [14] L.L. Weaver, A.R. Darragh, Systematic review of yoga interventions for anxiety reduction among children and adolescents, *Am. J. Occup. Ther.* 69 (6) (2015) 1–7, <https://doi.org/10.5014/ajot.2015.020115>.
- [15] J. Brinsley, F. Schuch, O. Lederman, D. Girard, M. Smout, M.A. Immink, B. Stubbs, J. Firth, K. Davison, S. Rosenbaum, Effects of yoga on depressive symptoms in people with mental disorders: a systematic review and meta-analysis, *Br. J. Sports Med.* (2020) 1–10, <https://doi.org/10.1136/bjsports-2019-101242>, 0.
- [16] B.L. Niles, D.L. Mori, C. Polizzi, A. Pless Kaiser, E.S. Weinstein, M. Gershkovich, C. Wang, A systematic review of randomized trials of mind-body interventions for PTSD, *J. Clin. Psychol.* 74 (9) (2018) 1485–1508, <https://doi.org/10.1002/jclp.22634>.
- [17] E. Della Valle, S. Palermi, I. Aloe, R. Marcantonio, R. Spera, S. Montagnani, F. Sirico, Effectiveness of workplace yoga interventions to reduce perceived stress in employees: a systematic review and meta-analysis, *J. Funct. Morphol. Kinesiol.* 5 (2) (2020) 33, <https://doi.org/10.3390/jfmk5020033>.
- [18] C.L. Park, L. Finkelstein-Fox, E.J. Groessl, A.R. Elwy, S.Y. Lee, Exploring how different types of yoga change psychological resources and emotional well-being across a single session, *Compl. Ther. Med.* 49 (2020) 102354, <https://doi.org/10.1016/j.ctim.2020.102354>.
- [19] M. Balasubramaniam, S. Telles, P.M. Doraiswamy, Yoga on our minds: a systematic review of yoga for neuropsychiatric disorders, *Front. Psychiatr.* 3 (2013) 117, <https://doi.org/10.3389/fpsy.2012.00117>.
- [20] C.L. Park, A.R. Elwy, M. Maiya, A.J. Sarkin, K.E. Riley, S.V. Eisen, I. Gutierrez, L. Finkelstein-Fox, S.Y. Lee, D. Casteel, T. Braun, E.J. Groessl, The Essential properties of yoga questionnaire (EPYQ): psychometric properties, *Int. J. Yoga Ther.* 28 (1) (2018) 23–38, <https://doi.org/10.17761/2018-00016R2>.
- [21] L. Gaiswinkler, H. Unterrainer, A. Fink, H.-P. Kapfhammer, The relationship between yoga immersion, psychological wellbeing, and psychiatric symptoms, *Neuropsychiatry* 29 (2015) 29–35, <https://doi.org/10.1007/s40211-015-0139-9>.
- [22] S. Moonaz, D. Nault, H. Cramer, L. Ward, Clarify 2021: explanation and elaboration of the Delphi-based guidelines for the reporting of yoga research, *BMJ Open* 11 (8) (2021), e045812, <https://doi.org/10.1136/bmjopen-2020-045812>.
- [23] M.C. McCall, How might yoga work? An overview of potential underlying mechanisms, *J. Yoga Phys. Ther.* 3 (1) (2013) 1, <https://doi.org/10.4172/2157-7595.1000130>.
- [24] M.S. Tarsha, S. Park, S. Tortora, Body-centered interventions for psychopathological conditions: a review, *Front. Psychol.* 10 (2020) 2907, <https://doi.org/10.3389/fpsyg.2019.02907>.
- [25] P. Kishan, Yoga and spirituality in mental health: illness to wellness, *Indian J. Psychol. Med.* 42 (5) (2020) 411–420, <https://doi.org/10.1177/0253717620946995>.
- [26] M.B. Sullivan, M. Erb, L. Schmalzl, S. Moonaz, J. Noggle-Taylor, S.W. Porges, Yoga therapy and polyvagal theory: the convergence of traditional wisdom and contemporary neuroscience for self-regulation and resilience, *Front. Hum. Neurosci.* 12 (2018) 67, <https://doi.org/10.3389/fnhum.2018.00067>.
- [27] T. Gard, J.J. Noggle, C.L. Park, D.R. Vago, A. Wilson, Potential self regulatory mechanisms of yoga for psychological health, *Front. Hum. Neurosci.* 8 (2014) 770, <https://doi.org/10.3389/fnhum.2014.00770>.
- [28] R. Harvey, P. Andriopoulou, S. Grogan, Perceived mechanisms of change in therapeutic yoga targeting psychological distress, *J. Bodyw. Mov. Ther.* 24 (1) (2019) 274–280, <https://doi.org/10.1016/j.jbmt.2019.06.014>.
- [29] B.T. Tihanyi, P. Böör, L. Emanuels, F. Köteles, Mediators between yoga practise and psychological well-being: mindfulness, body awareness and satisfaction with body image, *Eur. J. Ment. Health* 11 (1–2) (2016) 112–127, <https://doi.org/10.5708/EJMH.11.2016.1-2.7>.
- [30] M. Kishida, S.K. Mama, L.K. Larkey, S. Elavsky, “Yoga resets my inner peace barometer”: a qualitative study illuminating the pathways of how yoga impacts one’s relationship to oneself and to others, *Compl. Ther. Med.* 40 (2018) 215–221, <https://doi.org/10.1016/j.ctim.2017.10.002>.
- [31] N. Butterfield, T. Schultz, P. Rasmussen, M. Proeve, Yoga and mindfulness for anxiety and depression and the role of mental health professionals: a literature review, *J. Ment. Health Train Educ. Pract.* 12 (1) (2017) 44–54, <https://doi.org/10.1108/JMHTEP-01-2016-0002>.
- [32] American Psychological Association, Dictionary Of Psychology: Psychological Distress, 2020, 29th January 2021, <https://dictionary.apa.org/psychological-distress>.
- [33] M.T. Tull, A. Aldao, Editorial overview: new directions in the science of emotion regulation, *Curr. Opin. Psychol.* 3 (2015) 4–10, <https://doi.org/10.1016/j.copsyc.2015.03.009>.
- [34] E. Sloan, K. Hall, R. Moulding, S. Bryce, H. Mildred, P.K. Staiger, Emotion regulation as a transdiagnostic treatment construct across anxiety, depression, substance, eating and borderline personality disorders: a systematic review, *Clin. Psychol. Rev.* 57 (2017) 141–163, <https://doi.org/10.1016/j.cpr.2017.09.002>.
- [35] K.L. Gratz, L. Roemer, Multidimensional assessment of emotion regulation and dysregulation: development, factor structure, and initial validation of the difficulties in emotion regulation scale, *J. Psychopathol. Behav. Assess.* 26 (1) (2004) 41–54, <https://link.springer.com/article/10.1023/B:JOBA.0000007455.0.8539.94>.
- [36] American Psychological Association, Dictionary of Psychology: Rumination, 2020, 4th January 2021, <https://dictionary.apa.org/rumination>.
- [37] A.V. Lawrence, A. Alkozei, M.S. Irgens, M.C. Acevedo-Molina, S.A. Brenner, A. B. Chandler, R.F. Chau, C.Y. Doyle, A.L. McKinney, S.N. Price, C.E. Shanzholtz, E. J. Van Etten, E.S. Ver Hoeve, D.A. Sbarra, M.F. O’Connor, Think again: adaptive repetitive thought as a transdiagnostic treatment for individuals predisposed to repetitive thinking styles, *J. Psychother. Integrat.* (2020), <https://doi.org/10.1037/int0000209>.
- [38] K. Wahl, T. Ehring, H. Kley, R. Lieb, A. Meyer, A. Kordon, C.V. Heinsel, M. Mazanec, S. Schönfeld, Is repetitive negative thinking a transdiagnostic process? A comparison of key processes of RNT in depression, generalized anxiety disorder, obsessive-compulsive disorder, and community controls, *J. Behav. Ther. Exp. Psychiatr.* 64 (2019) 45–53, <https://doi.org/10.1016/j.jbtep.2019.02.006>.
- [39] M. Fledderus, E.T. Bohlmeijer, M.E. Pietersfe, Does experiential avoidance mediate the effects of maladaptive coping styles on psychopathology and mental health? *Behav. Modif.* 34 (6) (2010) 503–519, <https://doi.org/10.1177/0145445510378379>.

- [40] P. Spinhoven, J. Drost, M. de Rooij, A.M. van Hemert, B.W. Penninx, A longitudinal study of experiential avoidance in emotional disorders, *Behav. Ther.* 45 (6) (2014) 840–850, <https://doi.org/10.1016/j.beth.2014.07.001>.
- [41] S. Tully, A. Wells, A.P. Morrison, An exploration of the relationship between use of safety-seeking behaviours and psychosis: a systematic review and meta-analysis, *Clin. Psychol. Psychother.* 24 (6) (2017) 1384–1405, <https://doi.org/10.1002/cpp.2099>.
- [42] C. Strauss, B.L. Taylor, J. Gu, W. Kuyken, R. Baer, F. Jones, K. Cavanagh, What is compassion and how can we measure it? A review of definitions and measures, *Clin. Psychol. Rev.* 47 (2016) 15–27, <https://doi.org/10.1016/j.cpr.2016.05.004>.
- [43] P. Gilbert, The origins and nature of compassion focused therapy, *Br. J. Clin. Psychol.* 53 (1) (2014) 6–41, <https://doi.org/10.1111/bjc.12043>.
- [44] R. McIntyre, P. Smith, K.A. Rimes, The role of self-criticism in common mental health difficulties in students: a systematic review of prospective studies, *Ment. Health Prev.* 10 (2018) 13–27, <https://doi.org/10.1016/j.mhp.2018.02.003>.
- [45] J. Cuppage, K. Baird, J. Gibson, R. Booth, D. Hevey, Compassion focused therapy: exploring the effectiveness with a transdiagnostic group and potential processes of change, *Br. J. Clin. Psychol.* 57 (2) (2018) 240–254, <https://doi.org/10.1111/bjc.12162>.
- [46] I.C. Marsh, S.W. Chan, A. MacBeth, Self-compassion and psychological distress in adolescents—a meta-analysis, *Mindfulness* 9 (4) (2018) 1011–1027, <https://link.springer.com/article/10.1007/s12671-017-0850-7>.
- [47] P. Gilbert, Introducing compassion-focused therapy, *Adv. Psychiatr. Treat.* 15 (3) (2009) 199–208, <https://doi.org/10.1192/apt.bp.107.005264>.
- [48] K.D. Neff, Self-compassion: an alternative conceptualization of a healthy attitude toward oneself, *Self Ident.* 2 (2003) 85–102, <https://doi.org/10.1080/15298860390129863>.
- [49] M. García-Gómez, J. Guerra, V.M. López-Ramos, J.M. Mestre, Cognitive fusion mediates the relationship between dispositional mindfulness and negative affects: a study in a sample of Spanish children and adolescent school students, *Int. J. Environ. Res. Publ. Health* 16 (23) (2019) 4687, <https://doi.org/10.3390/ijerph16234687>.
- [50] J. Krafft, J.A. Haeger, M.E. Levin, Comparing cognitive fusion and cognitive reappraisal as predictors of college student mental health, *Cognit. Behav. Ther.* 48 (3) (2019) 241–252, <https://doi.org/10.1080/16506073.2018.1513556>.
- [51] L. Stopa, Imagery and the threatened self: an introduction, in: L. Stopa (Ed.), *Imagery and the Threatened Self: Perspectives on Mental Imagery and the Self in Cognitive Therapy*, Routledge, 2009, pp. 1–15.
- [52] C.R. Brewin, J.D. Gregory, M. Lipton, N. Burgess, Intrusive images in psychological disorders: characteristics, neural mechanisms, and treatment implications, *Psychol. Rev.* 117 (1) (2010) 210–232, <https://doi.org/10.1037/a0018113>.
- [53] A. Bennetts, L. Stopa, K. Newman-Taylor, Does mental imagery affect paranoia, anxiety and core beliefs? A pilot experimental study in an analogue sample, *Psychosis* 12 (2) (2020) 182–187, <https://doi.org/10.1080/17522439.2019.1697731>.
- [54] G. Bullock, K. Newman-Taylor, L. Stopa, The role of mental imagery in non-clinical paranoia, *J. Behav. Ther. Exp. Psychiatr.* 50 (2016) 264–268, <https://doi.org/10.1016/j.jbtep.2015.10.002>.
- [55] K.H. Racer, T.J. Dishion, Disordered attention: implications for understanding and treating internalizing and externalizing disorders in childhood, *Cognit. Behav. Pract.* 19 (1) (2012) 31–40, <https://doi.org/10.1016/j.cbpra.2010.06.005>.
- [56] S.C. Hayes, S.G. Hofmann, The third wave of cognitive behavioral therapy and the rise of process-based care, *World Psychiatr.* 16 (3) (2017) 245, <https://doi.org/10.1002/wps.20442>.
- [57] L. Wimmer, S. Bellingrath, L. von Stockhausen, Mindfulness training for improving attention regulation in university students: is it effective? and do yoga and homework matter? *Front. Psychol.* 11 (2020) 719, <https://doi.org/10.3389/fpsyg.2020.00719>.
- [58] S.L. Keng, M.J. Smoski, C.J. Robins, Effects of mindfulness on psychological health: a review of empirical studies, *Clin. Psychol. Rev.* 31 (6) (2011) 1041–1056, <https://doi.org/10.1016/j.cpr.2011.04.006>.
- [59] S. Im, J. Stavas, J. Lee, Z. Mir, H. Hazlett-Stevens, G. Caplovitz, Does mindfulness-based intervention improve cognitive function?: a meta-analysis of controlled studies, *Clin. Psychol. Rev.* 84 (2021) 101972, <https://doi.org/10.1016/j.cpr.2021.101972>.
- [60] S.A. Schuette, N.L. Zucker, M.J. Smoski, Do interoceptive accuracy and interoceptive sensibility predict emotion regulation? *Psychol. Res.* 85 (2021) 1894–1908, <https://doi.org/10.1007/s00426-020-01369-2>.
- [61] S.S. Khalsa, R. Adolphs, O.G. Cameron, H.D. Critchley, P.W. Davenport, J. S. Feinstein, J.D. Feusner, S.N. Garfinkel, R.D. Lane, W.E. Mehling, A.E. Meuret, C.B. Nemeroff, S. Oppenheimer, F.H. Petzschner, O. Pollatos, J.L. Rhudy, L. P. Schramm, W.K. Simmons, M.B. Stein, K.E. Stephan, O. Van der Berg, I. Van Deist, A. von Leupoldt, M.P. Paulus, The interoception summit participants, interoception and mental health: a roadmap, *Biol. Psychiatr. Cognit. Neurosci. Neuroimaging* 3 (6) (2018) 501–513, <https://doi.org/10.1016/j.bpsc.2017.12.004>.
- [62] D.A. Trevisan, M.R. Altschuler, A. Bagdasarov, C. Carlos, S. Duan, E. Hamo, S. Kala, M.L. McNair, T. Parker, D. Stahl, T. Winkelman, M. Zhou, J. C. McPartland, A meta-analysis on the relationship between interoceptive awareness and alexithymia: distinguishing interoceptive accuracy and sensibility, *J. Abnorm. Psychol.* 128 (8) (2019) 765–776, <https://doi.org/10.1037/abn0000454>.
- [63] C. Baglioni, S. Nanovska, W. Regen, K. Spiegelhalter, B. Feige, C. Nissen, C. F. Reynolds, D. Riemann, Sleep and mental disorders: a meta-analysis of polysomnographic research, *Psychol. Bull.* 142 (9) (2016) 969–990, <https://doi.org/10.1037/bul0000053>.
- [64] E. Hertenstein, B. Feige, T. Gmeiner, C. Kienzler, K. Spiegelhalter, A. Johann, M. Jansson-Fröjmark, L. Palagani, G. Rücker, D. Riemann, C. Baglioni, Insomnia as a predictor of mental disorders: a systematic review and meta-analysis, *Sleep Med. Rev.* 43 (2019) 96–105, <https://doi.org/10.1016/j.smrv.2018.10.006>.
- [65] C.N. de Novaes Soares, O.P. Almeida, H. Joffe, L.S. Cohen, Efficacy of estradiol for the treatment of depressive disorders in perimenopausal women: a randomized, double-blind, placebo-controlled trial, *Arch. Gen. Psychiatr.* 58 (2001) 529–534, <https://doi.org/10.1001/archpsyc.58.6.529>.
- [66] E.M.M. Portugal, T. Cevada, R.S. Monteiro-Junior, T.T. Guimarães, E. da Cruz Rubini, E. Lattari, C. Blois, A.C. Deslandes, Neuroscience of exercise: from neurobiology mechanisms to mental health, *Neuropsychobiology* 68 (1) (2013) 1–14, <https://doi.org/10.1159/000350946>.
- [67] The Human Cooperative, The cooperative human, *Nat. Hum. Behav.* 2 (2018) 427–428, <https://doi.org/10.1038/s41562-018-0389-1>.
- [68] L.P. Wendt, A.G. Wright, P.A. Pilkonis, T. Nolte, P. Fonagy, P.R. Montague, C. Benecke, T. Krieger, J. Zimmermann, The latent structure of interpersonal problems: validity of dimensional, categorical, and hybrid models, *J. Abnorm. Psychol.* 128 (8) (2019) 823–839, <https://doi.org/10.1037/abn0000460>.
- [69] L.L. Seow, A.C. Page, G.R. Hooke, Severity of borderline personality disorder symptoms as a moderator of the association between the use of dialectical behaviour therapy skills and treatment outcomes, *Psychother. Res.* 30 (7) (2020) 920–933, <https://doi.org/10.1080/10503307.2020.1720931>.
- [70] S. Parker, *The Concise Human Body Book*, Dorling Kindersley Ltd [DK], 2019.
- [71] S.W. Porges, Vagal pathways: portals to compassion, in: E.M. Seppälä, E. Simon-Thomas, S.L. Brown, M.C. Worline, C.D. Cameron, J.R. Doty (Eds.), *The Oxford Handbook of Compassion Science*, Oxford University Press, 2017, pp. 189–202.
- [72] S.W. Porges, *The Pocket Guide to Polyvagal Theory: the Transformative Power Of Feeling Safe*, W. W. Norton & Company, Inc, 2017.
- [73] M.M. Linehan, *DBT Skills Training Manual*, second ed., The Guildford Press, 2015.
- [74] R. Dudley, W. Kuyken, Case formulation in cognitive behavioural therapy: a principle-driven approach, in: L. Johnstone, R. Dallos (Eds.), *Formulation In Psychology and Psychotherapy: Making Sense of People's Problems*, second ed., Routledge, 2014, pp. 18–45.
- [75] J.J. Kim, S.L. Parker, J.R. Doty, R. Cunningham, P. Gilbert, J.N. Kirby, Neurophysiological and behavioural markers of compassion, *Sci. Rep.* 10 (2020) 6789, <https://doi.org/10.1038/s41598-020-63846-3>.
- [76] H. Kirschner, W. Kuyken, K. Wright, H. Roberts, C. Brejcha, A. Karl, Soothing your heart and feeling connected: a new experimental paradigm to study the benefits of self-compassion, *Clin. Psychol. Sci.* 7 (3) (2019) 545–565, <https://doi.org/10.1177/2167702618812438>.
- [77] M. Marshall, M. McClanahan, S. McArthur Warren, R. Rogers, C. Ballmann, A comparison of the acute effects of different forms of yoga on physiological and psychological stress: a pilot study, *Int. J. Environ. Res. Publ. Health* 17 (2020) 6090, <https://doi.org/10.3390/ijerph17176090>.
- [78] V. Villani, M. Tsakiris, R.T. Azevedo, Transcutaneous vagus nerve stimulation improves interoceptive accuracy, *Neuropsychologia* 134 (2019) 107201, <https://doi.org/10.1016/j.neuropsychologia.2019.107201>.
- [79] S. Gerhardt, *Why Love Matters: How Affection Shapes a Baby's Brain*, Routledge, 2004.
- [80] M. Stephens, *Teaching Yoga: Essential Foundations and Techniques*, North Atlantic Books, 2010.
- [81] A.T. Beck, A.J. Rush, B.F. Shaw, G. Emery, *Cognitive Therapy and Depression*, The Guildford Press, 1979.
- [82] S.C. Hayes, K.G. Wilson, E.V. Gifford, V.M. Follette, K. Strosahl, Experiential avoidance and behavioral disorders: a functional dimensional approach to diagnosis and treatment, *J. Consult. Clin. Psychol.* 64 (6) (1996) 1152, <https://doi.org/10.1037/0022-006X.64.6.1152>.
- [83] M. Linehan, *Cognitive-behavioral Treatment of Borderline Personality Disorder*, Guildford Press, 1993.
- [84] T. Bell, *The Therapeutic Relationship in Compassion-Focused Therapy Chair Work*, The Compassionate Mind Foundation, 2018, https://www.researchgate.net/publication/325954112_The_Therapeutic_Relationship_in_Compassion-Focused_Therapy_Chair-Work.
- [85] R. Bennett, J.E. Oliver, *Acceptance And Commitment Therapy: 100 Key Points and Techniques*, Routledge, 2019.
- [86] C. Craig, S. Hiskey, A. Spector, Compassion focused therapy: a systematic review of its effectiveness and acceptability in clinical populations, *Expert Rev. Neurother.* 20 (4) (2020) 385–400, <https://doi.org/10.1080/14737175.2020.1746184>.
- [87] S. Ofei-Dodoo, A. Cleland-Leighton, K. Nilsen, J.L. Cloward, E. Casey, Impact of a mindfulness-based, workplace group yoga intervention on burnout, self care, and compassion in health care professionals: a pilot study, *J. Occup. Environ. Med.* 62 (8) (2020) 581–587, <https://doi.org/10.1097/JOM.000000000000189>.
- [88] D. Adele, *The Yamas and Niyamas: Exploring Yoga's Ethical Practise*, On-Word Bound Books LLC, 2009.
- [89] R.E. Maddux, D. Daukantaitė, U. Tellhed, The effects of yoga on stress and psychological health among employees: an 8-and 16-week intervention study, *Hist. Philos. Logic* 31 (2) (2018) 121–134, <https://doi.org/10.1080/10615806.2017.1405261>.
- [90] L.A. Daly, S.C. Haden, M. Hagins, N. Papouchis, P.M. Ramirez, Yoga and emotion regulation in high school students: a randomized controlled trial, *Evid. base Compl. Alternative Med.* (2015) 794928, <https://doi.org/10.1155/2015/794928>.

- [91] K. Street, Effectiveness of Ashtanga and Vinyasa Yoga: *Combating Anxiety, Depression, Stress and Sleep Quality* [Unpublished doctoral dissertation], University of Arkansas, 2020, <https://scholarworks.uark.edu/etd/3816>.
- [92] C.L. La Rocque, R. Mazurka, T.J. Stuckless, K. Pyke, K.L. Harkness, Randomized controlled trial of bikram yoga and aerobic exercise for depression in women: efficacy and stress-based mechanisms, *J. Affect. Disord.* 280 (2021) 457–466, <https://doi.org/10.1016/j.jad.2020.10.067>.
- [93] American Psychological Association, Dictionary of Psychology: Acceptance, 2020, 4th January 2021, <https://dictionary.apa.org/acceptance>.
- [94] H.G. Cramer, H. Haller, G. Dobos, R. Lauche, A systematic review and meta analysis estimating the expected dropout rates in randomized controlled trials on yoga interventions, *Evid. base Compl. Alternative Med.* (2016) 5859729, <https://doi.org/10.1155/2016/5859729>.
- [95] R. Harris, *Choice Point 2.0: A Brief Overview*. Act Mindfully, 2017. Retrieved 17 May 2021 from, https://www.actmindfully.com.au/wp-content/uploads/2018/06/Choice-Point-2.0-A-Brief-Overview_-Russ-Harris-April-2017.pdf.
- [96] G. Feuerstein, *The Yoga Tradition: Its History, Literature, Philosophy and Practise*, Hohm Press, 2008.
- [97] H.G. Koenig, Spirituality and mental health, *Int. J. Appl. Psychoanal. Stud.* 7 (2) (2010) 116–122, <https://doi.org/10.1002/aps.239>.
- [98] F. Dolcos, K. Hohl, Y. Hu, S. Dolcos, Religiosity and resilience: cognitive reappraisal and coping self-efficacy mediate the link between religious coping and well-being, *J. Relig. Health* (2021) 1–14, <https://doi.org/10.1007/s10943-020-01160-y>.
- [99] M.C. Pascoe, D.R. Thompson, C.F. Ski, Yoga, mindfulness-based stress reduction and stress-related physiological measures: a meta-analysis, *Psychoneuroendocrinology* 86 (2017) 152–168, <https://doi.org/10.1016/j.psyneuen.2017.08.008>.
- [100] S.S. Saraswati, *Asana, Pranayama, Mudra, Bandha*, Bihar School of Yoga, 2008.
- [101] R.A. Franklin, M.P. Butler, J.A. Bentley, The physical postures of yoga practises may protect against depressive symptoms, even as life stressors increase: a moderation analysis, *Psychol. Health Med.* 23 (7) (2018) 870–879, <https://doi.org/10.1080/13548506.2017.1420206>.
- [102] S.W. Porges, Social engagement and attachment: a phylogenetic perspective, *Ann. N. Y. Acad. Sci.* 1008 (2003) 31–47, <https://doi.org/10.1196/annals.1301.004>.
- [103] A.A. Saoji, B.R. Raghavendra, N.K. Manjunath, Effects of yogic breath regulation: a narrative review of scientific evidence, *J. Ayurveda Integr. Med.* 10 (1) (2019) 50–58, <https://doi.org/10.1016/j.jaim.2017.07.008>.
- [104] M.A. Austin, T.C. Riniolo, S.W. Porges, Borderline personality disorder and emotion regulation: insights from the Polyvagal Theory, *Brain Cognit.* 65 (1) (2007) 69–76, <https://doi.org/10.1016/j.bandc.2006.05.007>.
- [105] M.G. Miglis, Sleep and the autonomic nervous system, in: M.G. Miglis (Ed.), *Sleep and Neurologic Disease*, Academic Press, 2017, pp. 227–244.
- [106] P. Gilbert, Psychotherapy for the 21st century: an integrative, evolutionary, contextual, biopsychosocial approach, *Psychol. Psychother. Theor. Res. Pract.* 92 (2019) 164–189, <https://doi.org/10.1111/papt.12226>.
- [107] J. Kabat-Zinn, *Wherever you go, there you are: Mindfulness meditation for everyday life*, Piatkus (1994).
- [108] S.B. Goldberg, R.P. Tucker, P.A. Greene, R.J. Davidson, B.E. Wampold, D. K. Kearney, T.L. Simpson, Mindfulness-based interventions for psychiatric disorders: a systematic review and meta-analysis, *Clin. Psychol. Rev.* 59 (2018) 52–60, <https://doi.org/10.1016/j.cpr.2017.10.011>.
- [109] B. Khoury, M. Sharma, S.E. Rush, C. Fournier, Mindfulness-based stress reduction for healthy individuals: a meta-analysis, *J. Psychosom. Res.* 78 (6) (2015) 519–528, <https://doi.org/10.1016/j.jpsychores.2015.03.009>.
- [110] S. Zoogman, S.B. Goldberg, W.T. Hoyt, L. Miller, Mindfulness interventions with youth: a meta-analysis, *Mindfulness* 6 (2) (2015) 290–302, <https://doi.org/10.1007/s12671-013-0260-4>.
- [111] S.J. Joice, K.A. Manik, P.K. Sudhir, Role of yoga in attention, concentration, and memory of medical students, *Natl. J. Physiol. Pharm. Pharmacol.* 8 (11) (2018) 1526–1528, <https://doi.org/10.5455/njppp.2018.8.0723521082018>.
- [112] S. Telles, P. Raghuraj, D. Arankalle, K.V. Naveen, Immediate effect of high-frequency yoga breathing on attention, *Indian J. Med. Sci.* 62 (1) (2008) 20–22.
- [113] C. Conversano, R. Ciacchini, G. Orrù, M. Di Giuseppe, A. Gemignani, A. Poli, Mindfulness, compassion, and self-compassion among health care professionals: what's new? A systematic review, *Front. Psychol.* 11 (2020) 1683, <https://doi.org/10.3389/fpsyg.2020.01683>.
- [114] S. Guendelman, S. Medeiros, H. Rampes, Mindfulness and emotion regulation: insights from neurobiological, psychological, and clinical studies, *Front. Psychol.* 8 (2017) 220, <https://doi.org/10.3389/fpsyg.2017.00220>.
- [115] U. Kreplin, M. Farias, I.A. Brazil, The limited prosocial effects of meditation: a systematic review and meta-analysis, *Sci. Rep.* 8 (1) (2018) 1–10, <https://doi.org/10.1038/s41598-018-20299-z>.
- [116] C. Irons, E. Beaumont, Robinson, *The Compassionate Mind Workbook: a step-by-step guide to developing your compassionate self*, 2017.
- [117] The Compassionate Mind Foundation, Soothing Rhythm Breathing Practises, 2017. Soundcloud. Retrieved 16 March 2021 from, <https://soundcloud.com/compassionatemind/soothing-rhythm-breathing-practises/s-JA0g8?in=compassionatemind/sets/compassionate-minds>.
- [118] S. Kriyananda, *Awaken to Superconsciousness*, Crystal Clarity Publishers, 2008.
- [119] K. Hall, *Mindfulness Exercises for DBT Therapists*, CreateSpace Independent Publishing Platform, 2013.
- [120] E.A. Holmes, A. Mathews, Mental imagery and emotion: a special relationship? *Emotion* 5 (4) (2005) 489–497, <https://doi.org/10.1037/1528-3542.5.4.489>.
- [121] Yogin, Samadhi (Bliss or Enlightenment): The Eighth Limb of Yoga Explained, The Yoga Space, 2015, July 1. <https://theyogaspace.co.uk/blog/PostId/235/samadhi-bliss-or-enlightenment-the-eighth-limb-of-yoga-explained>.
- [122] C.C. Cook, Spirituality, religion & mental health: exploring the boundaries, *Ment. Health Relig. Cult.* 23 (5) (2020) 363–374, <https://doi.org/10.1080/13674676.2020.1774525>.
- [123] L.R. Saslow, O.P. John, P.K. Piff, R. Willer, E. Wong, E.A. Impett, A. Kogan, O. Antonenko, K. Clark, M. Feinberg, D. Keltner, S.R. Saturn, The social significance of spirituality: new perspectives on the compassion–altruism relationship, *Psychol. Relig. Spiritual.* 5 (3) (2013) 201–218, <https://doi.org/10.1037/a0031870>.
- [124] B. Jowkar, F. Kamali, *The relationship between spirituality and cognitive emotion regulation*, *J. Iran. Psychol.* 12 (48) (2016) 377–385.
- [125] K.D. Phillips, K.S. Mock, C.M. Bopp, W.A. Dudgeon, G.A. Hand, Spiritual well-being, sleep disturbance, and mental and physical health status in HIV infected individuals, *Issues Ment. Health Nurs.* 27 (2) (2006) 125–139, <https://doi.org/10.1080/01612840500436917>.
- [126] L. Johnstone, R. Dallos, *Formulation In Psychology and Psychotherapy: Making Sense of People's Problems*, second ed., Routledge, 2014.
- [127] C.L. Park, L. Finkelstein-Fox, S.J. Sacco, T.D. Braun, S. Lazar, How does yoga reduce stress? A clinical trial testing psychological mechanisms, *Stress Health* 37 (2021) 116–226, <https://doi.org/10.1002/smi.2977>.
- [128] V.S. Cowen, T.B. Adams, Physical and perceptual benefits of yoga asana practise: results of a pilot study, *J. Bodyw. Mov. Ther.* 9 (3) (2005) 211–219, <https://doi.org/10.1016/j.jbmt.2004.08.001>.
- [129] D. Stockton, S. Kellett, R. Berrios, F. Sirois, N. Wilkinson, G. Miles, Identifying the underlying mechanisms of change during acceptance and commitment therapy (ACT): a systematic review of contemporary mediation studies, *Behav. Cognit. Psychother.* 47 (3) (2019) 332–362, <https://doi.org/10.1017/S1352465818000553>.
- [130] M. Sommers-Spijkerman, H. Trompetter, K. Schreurs, E. Bohlmeijer, Pathways to improving mental health in compassion-focused therapy: self reassurance, self-criticism and affect as mediators of change, *Front. Psychol.* 9 (2018) 2442, <https://doi.org/10.3389/fpsyg.2018.02442>.
- [131] T.R. Lynch, A.L. Chapman, M.Z. Rosenthal, J.R. Kuo, M.M. Linehan, Mechanisms of change in dialectical behavior therapy: theoretical and empirical observations, *J. Clin. Psychol.* vol. 62 (4) (2006) 459–480, <https://doi.org/10.1002/jclp.20243>.
- [132] P. Gilbert, K. McEwan, F. Catarino, R. Baião, Fears of Compassion in a Depressed Population Implication for Psychotherapy, *J. Depress. Anxiety* S2 (2014), 003, <https://doi.org/10.4172/2167-1044.S2-003>.



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