



# Wisdom-Based Buddhist-Derived Meditation Practices for Prosocial Behaviour: A Systematic Review

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## Abstract

**Objectives** The objective of this evaluative systematic review was to analyse the impact of mindfulness-based interventions (MBIs) that incorporate Buddhist wisdom practices on prosocial behaviour, and provide insights into their underlying mechanism, potential benefits, and applications.

**Method** A systematic literature search was conducted using three electronic databases up until 1 December 2023. Data on the participants in the MBIs, the structure, and how Buddhist teachings were integrated were collected. The impact on prosocial behaviour was analysed, along with evaluating overall study quality and the validity of the measures used for assessing changes in prosocial behaviour.

**Results** Collectively, the 12 eligible studies ( $n = 2185$ ) suggest that incorporating the Buddhist wisdom practices of contemplating interdependence, emptiness, and perspective-taking on self and others may enhance prosocial behaviour through various mechanisms, such as (i) developing a sense of interdependence and common humanity, (ii) fostering the altruistic desire to help others, and (iii) experiencing a state of oneness. However, concerns were raised about the overuse and reliability of self-report measures for accurately assessing prosocial behaviour, as well as in respect of discerning the effectiveness of different meditation practices that are integrated into MBIs.

**Conclusions** Overall, the findings of this systematic literature review reinforce the perspective that wisdom-based meditation practices contribute to prosocial behaviour. However, to enhance the understanding of the underlying causes of prosocial behaviour, future studies should isolate the effects of different meditation practices incorporated within MBIs. Furthermore, it is strongly recommended that future studies assessing the impact of MBIs on prosocial behaviour employ a range of diverse measures, such as self-reported psychometric scales in combination with real-world morally relevant scenarios.

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**Keywords** Mindfulness-based interventions · Buddhist meditation practices · Systematic review · Prosocial behaviour · Interdependence · Altruism

Traditional Buddhist meditation can be categorized by the “three trainings” principle, or *trīśikṣā*, which encompasses concentration (*samādhi*), ethics (*sīla*), and wisdom (*prajñā*) practices (Anālayo, 2017). These practices, according to the Dalai Lama (2021), can be universally beneficial, transcending cultural and religious affiliations, by reducing suffering, nurturing peaceful and prosocial actions, and contributing to a happier world. *Samādhi* trainings, also referred to as Concentration-Based practices, include meditative techniques

for stabilizing the mind and enabling the practitioner to concentrate with a calm and focussed awareness; whereas *sīla* trainings, also known as Ethics-Based practices, encompass meditation techniques intended to purify the mind from unwholesome qualities such that the practitioner can think clearly and with compassion; lastly, *prajñā* trainings, also referred to as Wisdom-Based practices, comprise meditations centred around investigating and intuiting the nature of existence, in an effort to gain insight into non-duality and inter-being (Furnell et al., 2024; see Table 1).

Although traditional Buddhist meditation encompasses the “three trainings” (*trīśikṣā*), the majority of empirical research into Buddhist-Derived Meditation Practices have isolated these trainings, primarily focussing on either

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**Table 1** Categorization of Concentration-, Ethics-, and Wisdom-Based meditation practices

Concentration-Based	Ethics-Based	Wisdom-Based
Related training: concentration ( <i>samādhi</i> )	Related training: ethics ( <i>sīla</i> )	Related training: wisdom ( <i>prajñā</i> )
Primary focus: Attention and interoceptive awareness practices	Primary focus: Practices that nurture compassion and regulate emotions	Primary focus: Changing perspective of self, embracing non-attachment and interconnectedness
Meditation type: Stabilizing	Meditation type: Purifying	Meditation type: Investigating and Intuiting
Example of meditation practice: Awareness of Breath	Example of meditation practice: Generating Loving-Kindness	Example of meditation practice: Contemplating Interdependence

Concentration- or Ethics-Based practices. This is potentially problematic as it is the interaction and synergy among the “three trainings” that is crucial for attaining the meditative calmness and clarity necessary to facilitate insight into the ultimate nature of reality and the alleviation of suffering (Nhat Hanh, 1998). Moreover, research suggests meditation interventions lacking practices related to the trainings of ethics and wisdom may lead to unintended consequences, such as increased self-centredness, reduced psychological well-being, and a negative impact on prosocial behaviour (Bayot et al., 2020; Feruglio et al., 2022).

In the 1980s, the first generation of empirical studies into Buddhist-Derived Meditation Practices (BDPs) predominantly investigated Mindfulness Meditation, a type of non-judgemental awareness of experiences in the present moment (Kabat-Zinn, 2003). Mindfulness Meditation, distinct from mindfulness as a trait or as a concept in Buddhist philosophy, was popularized by the development of mindfulness-based interventions (MBIs) and can be categorized as a Concentration-Based practice to stabilize the mind (Furnell et al., 2024). As the twenty-first century began, a second generation of research arose which attempted to integrate Buddhist ethical practices into MBIs (Van Gordon et al., 2019). Among these additional BDPs, meditations on The Four Immeasurables (*Brahmavihārās*), including loving-kindness, compassion, empathetic-joy, and equanimity, became more widely utilized in empirical studies (Zeng et al., 2017), closely aligning with the categorization of Ethics-Based practices for purifying the mind of unwholesome qualities such as anger, hate, jealousy, or discrimination. More recently, there has been a growing interest in understanding how more investigative and intuitive meditation techniques, such as contemplations on interdependence and emptiness, categorized as Wisdom-Based practices, can influence the outcomes of mindfulness interventions (Bhutekar & Shirsath, 2019; Fazia et al., 2021; see Table 1).

However, it should be noted that although a given MBI might be regarded as primarily including, for example, Wisdom-Based practices, it is likely that a combination of Concentration-, Ethics-, or Wisdom-Based practices will be integrated within a given intervention (Furnell et al., 2024). For example, arguably every MBI will include

Concentration-Based practices, as establishing awareness and attention of the breath (a Concentration-Based practice) is a foundational technique for the majority of Buddhist, and non-Buddhist, meditations (Buddhadasa, 1997). MBIs then may additionally incorporate Ethics- or Wisdom-Based practices, resulting in an intervention that includes a combination of the three categorized meditation practices.

More specifically, Wisdom-Based BDPs are meditation practices that emphasize the cultivation of wisdom and insight into the three Buddhist existential principles (*tilakkhaṇa*), namely, impermanence, unsatisfactoriness caused by attachment, and no-self (Anālayo, 2017). These practices highlight the realization of, for example, interdependence, emptiness, and oneness (Dalai Lama, 2019). The primary purpose of Wisdom-Based BDPs is to address the Buddhist understanding of the ultimate cause of suffering: an attachment to an independent-permanent self (Chah, 2011). This attachment to an erroneous self has been termed Ontological Addiction, which studies suggest can have detrimental effects on cognitive abilities and psychological well-being (Barrows et al., 2023). For the purpose of this systematic review, Wisdom-Based practices will include meditative techniques that focus on contemplating interdependence and interconnectedness, perspective taking on self and others, and the emptiness of an independent-permanent self.

Additionally, while early research on MBIs primarily focused on investigating the correlation between meditation practices and the reduction of negative emotional and physical states (Berry et al., 2020), more recent studies have adopted a positive psychological perspective to explore how MBIs can promote positive emotions, improved relationships, and heightened awareness (Zheng et al., 2022). Furthermore, there has been a growing trend to not only assess how meditation influences personal psychological well-being but also a recognition of the potential for MBIs to enhance prosocial behaviour (Berry et al., 2020). This signifies a shift from the individual-oriented approach to a more holistic perspective that acknowledges the interconnectedness of personal and social well-being (Feruglio et al., 2022).

Prosocial behaviour, also referred to as altruistic or moral behaviour, can be broadly defined as any action that benefits one or more recipients other than the originator (Pfattheicher et al., 2022). Empirical research investigating the effect of meditation on prosocial behaviour has operationalized prosocial behaviour in various ways. These include helping behaviour (Leiberg et al., 2011), altruistic redistribution of funds (Weng et al., 2013), reparative behaviour (Hafenbrack et al., 2022), monetary donation (Chen & Jordan, 2020), and in certain cases pro-environmental behaviour, where individuals make choices to reduce the negative impact of their actions on the environment, its inhabitants, and future generations (Kollmuss & Agyeman, 2002; Palomo-Vélez et al., 2020).

There is still much debate around how meditation practices positively relate to moral and prosocial behaviour. The systematic review and meta-analysis by Donald et al. (2019) explored the link between mindfulness and prosocial behaviour, focusing on both trait mindfulness and mindfulness interventions. Their review found that interventions focusing on the cultivation of prosocial emotions such as Loving-Kindness and Compassion Meditation did not have a greater impact on prosocial behaviour when compared to interventions that only focussed on cultivating present-centred awareness, such as Mindfulness Meditation. Therefore, current evidence does not seem to support the role of Ethical-Based practices within MBIs as a meditating factor for promoting prosociality. Rather, it suggests that the link between MBIs and prosocial outcomes is due to an increase in present-centred awareness and its subsequent impact on an individual's self-control and ability to detect morally relevant information in the present moment (Donald et al., 2019).

However, two major limitations of the abovementioned review were that firstly, it encompassed a diverse array of meditation interventions with a substantial variety of meditation practices and secondly, included a wide range of measures for prosocial behaviour, impacting the ability to draw reliable inferences from the pooled effects (Donald et al., 2019). Another meta-analysis tried to address such limitations by separating meditation interventions into two distinct categorizations: those that explicitly included Ethics-Based practices and those that did not (Berry et al., 2020). Additionally, to reduce the potential bias associated with self-reported measures of prosocial behaviour, the analysis focussed on overt measures of prosocial action. It found that the effects of MBIs on overt prosocial behaviour were not limited to meditation interventions that explicitly included ethical practices, but Concentration-Based practices alone were effective at increasing compassionate helping behaviour (Berry et al., 2020).

However, the results from the reviews by Donald et al. (2019) and Berry et al. (2020) contradict theory put forward

by Monteiro et al. (2015) as well as results from previous studies (Chen & Jordan, 2020; Poulin et al., 2021), which both support the idea that including Ethics-Based practices within meditation interventions promotes higher prosocial action relative to interventions with no ethical component. These contradictions may be attributed to the broad categorization of studies used in previous reviews. Neither Donald et al. (2019) nor Berry et al. (2020) differentiated between interventions that incorporated Ethics-Based practices and those that included both Ethics- and Wisdom-Based practices. It is possible that ethical practices alone may not be enough to drive changes in prosocial behaviour, while the integration of both ethical and Buddhist wisdom practices could be essential for a significant impact on prosocial behaviour, potentially contributing to the observed contradictory results in previous studies.

This notion is supported by Thiermann and Sheate's (2021) systematic review of the relationship between mindfulness and environmental sustainability which highlighted a consensus among theoretical (Bahl et al., 2016; Thiermann & Sheate, 2020) and empirical studies (Amel et al., 2009; Hunecke & Richter, 2019) regarding the positive impact of insight into interconnectedness, self-transcendence, and impermanence on pro-environmental behaviour. Nevertheless, most empirical studies examining this connection have focused on participants' trait mindfulness without incorporating any form of mindfulness intervention (Thiermann & Sheate, 2021). While Wisdom-Based practices such as interconnectedness and self-transcendence are well-recognized as underlying factors influencing behaviour in pro-environmental behaviour literature, their exploration remains limited within the broader literature linking MBIs with prosocial behaviour.

The underlying mechanisms explaining how mindfulness promotes prosocial behaviour are still not fully understood. In general, there are two main schools of thought: one suggests increased attention towards others and enhanced self-control, caused by Concentration-Based practices alone, mediate prosocial behaviours (Donald et al., 2019; Trautwein et al., 2020). The other proposes that prosocial behaviour is positively influenced by other-oriented motivation and a greater sense of responsibility towards others, resulting from MBIs including Ethical-Based practices (Feruglio et al., 2022). However, a third school of thought is emerging that suggests the erosion of ego-centric bias leads to the development of altruistic moral reasoning (Pandey et al., 2018), and that self-transcendence—insight into interdependence—is the underlining mechanism linking meditation with prosocial outcomes (Kang, 2019). In other words, changing an individual's perspective of self causes a feeling of interconnectedness with others, thereby influencing them to act in prosocial ways (Kang, 2019). Proponents of this perspective recognize that the inclusion of Wisdom-Based

practices such as the interdependence of all beings, impermanence, or emptiness into MBIs may encourage prosocial actions through a growing sense of interconnectedness (Bahl et al., 2016; Purser, 2015).

Despite growing interest in the effects of meditation practices on prosocial behaviour, there remains a notable gap in the literature concerning a comprehensive systematic review specifically focused on meditation interventions that incorporate Wisdom-Based BDPs. Existing systematic reviews and meta-analyses have predominantly examined different types of meditation practices, with a primary emphasis on the inclusion or exclusion of ethics as a differentiating factor, often overlooking Buddhist wisdom practices (Berry et al., 2020; Donald et al., 2019; Luberto et al., 2018).

To address this knowledge gap, we conducted a comprehensive systematic review to investigate the question: How do meditation-based interventions, that implicitly and/or explicitly include Wisdom-Based Buddhist Derived Practices, affect prosocial behaviour, as measured through empirical experiments? The present systematic review explored the influence of Wisdom-Based BDPs on prosocial behaviour and other-oriented altruistic motivation. By doing so, this systematic review aimed to gain valuable insights into the relationship between Wisdom-Based BDPs and prosocial behaviour. Additionally, this review further aimed to examine the underlying mechanisms of prosocial behaviour and provide insights into the potential benefits, applications, and development of MBIs.

## Method

### Eligibility Criteria

For papers to be included for detailed review and analysis, they had to (i) have been published in a peer-reviewed journal using the English language; (ii) report an empirical intervention study of an MBI that implicitly and/or explicitly made use of Buddhist wisdom principles; (iii) include pre- and post-intervention measures of dependent variables with adequate statistical analysis; and (iv) assess changes in prosocial tendencies through suitably validated self-reports (e.g., psychological trait questionnaires), hypothetical scenarios, or actual behaviour in morally relevant contexts. Papers were excluded from detailed review and analysis if they (i) contained no new empirical data (e.g., a descriptive and/or theoretical review paper), (ii) followed a single-participant design, (iii) did not include a control group, (iv) reported only qualitative data, (v) utilized an MBI where there was no implicit or explicit mention of Buddhist existence principles, or (vi) evaluated interventions that did not include meditation practices as a core component.

While it has been argued that studies relying solely on self-reported measures and hypothetical scenarios may have methodological limitations in assessing prosocial behaviour (Feruglio et al., 2022), widely used psychometric scales like the Prosocialness Scale for Adults (Caprara et al., 2005) and the Prosocial Behavioral Intentions Scale (Baumsteiger & Siegel, 2019) are considered valid measures in meditation literature (Luengo Kanacri et al., 2021). Likewise, certain compassion scales, including the Compassion Scale Towards Others (Pommier et al., 2020) and the Santa Clara Brief Compassion Scale (Hwang et al., 2008), are also commonly considered valid measures of prosocial tendencies within the meditation literature due to their inclusion of questions specifically assessing prosocial behaviour, and thus are considered as measures of prosocial behaviour for the purposes of this paper.

### Search Strategy and Selection Process

A comprehensive search was completed using Google Scholar, Science Direct, and PsychINFO electronic academic databases, with selected dates running from the start of database records until 1 December 2023. The search criteria included either Prosocial Behavi\*, Moral Behavi\*, Altruism or, Generosity, in combination with either MBI, Mindfulness, or Meditation, in combination with either Interconnected, Impermanence, Emptiness, Self-transcendence, Wisdom, Non-attachment, or Nonattachment. A preliminary review of each article's title, abstract, and keywords was conducted to identify if the research article included a meditation intervention as well as potential measures for prosocial outcomes.

The process of identifying, retrieving, assessing, and shortlisting abstracts was carried out by a single member of the research team. The chosen studies were subsequently transferred to an Excel spreadsheet, where a second member of the research team audited them to validate the initial team member's selection criteria. In all cases, agreement was reached between the first two research team members. The two assessors then independently undertook a full-text review of all shortlisted abstracts. Any disagreements relating to study eligibility were resolved through deliberation between the two research team members and in the event uncertainty persisted, a third member of the research team was available to decide the final outcome.

### Data Collection Process

Data was extracted from the included studies based on recommendations from the Cochrane Handbook for Systematic Reviews of Interventions (Li et al., 2022). Extracted data items included sample size, control-group design (e.g., wait-list, treatment-as-usual, comparative intervention,

purpose-made active control condition), specific details of the intervention (e.g., meditation practices, program and session length), location and setting (e.g., online or offline, live or recorded delivery), facilitator experience, diagnosis (where applicable), measurement tools and specific metrics (e.g., psychometric scales and other assessment measures for prosocial behaviour), as well as pre-, post-, and follow-up findings (if available). Subsequently, the studies were categorized into two groups: meditation interventions that explicitly incorporated Wisdom-Based BDPs (e.g., directly referencing Buddhist existence principles and crediting them to Buddhist philosophy) and meditation interventions that implicitly incorporated them.

### Quality Scoring and Risk of Bias Assessment

Following previous systematic reviews that assess the impact and effectiveness of MBIs and meditative practices (Kriakous et al., 2021; Lomas et al., 2019; Shonin et al., 2015), this review also assessed the quality and risk of bias of the included studies using the Quality Assessment Tool for Quantitative Studies (QATQS; National Collaborating Centre for Methods & Tools, 2008). Following the assessment of selection bias, study design, confounders, blinding, data collection methods, and withdrawal and dropouts, a global score of strong (1), moderate (2), or weak (3) was calculated for each study.

QATQS scoring was initially conducted by a single member of the research team, following guidelines specified in

the QATQS protocol. To ensure consistency and standardized results, a QATQS dictionary was utilized alongside the assessment tool. A second member of the research team then independently conducted QATQS scoring, and any deviations in scores between the two assessors were carefully examined, discussed, and reconciled.

## Results

### Study Selection

The initial comprehensive literature search identified a total of 1422 studies. After screening the titles and abstracts, 1337 studies were excluded as duplicates or for not meeting the criteria of being empirical studies on MBIs that measured prosocial behaviour. After a preliminary shortlist of 85 studies that underwent a full-text review, 12 studies were found to meet all the inclusion criteria and were subsequently audited by a second member of the research team (in all cases, a consensus on eligibility was reached between the first two research team members). Finally, all 12 studies were selected for in-depth review and assessment. Figure 1 shows the PRISMA flow diagram illustrating the process of paper selection.

Of the 85 papers that underwent a full-text review, the most common reason for exclusion was that the study did not implicitly and/or explicitly include mention of Wisdom-Based BDPs ( $n = 66$ ). For example, multiple studies

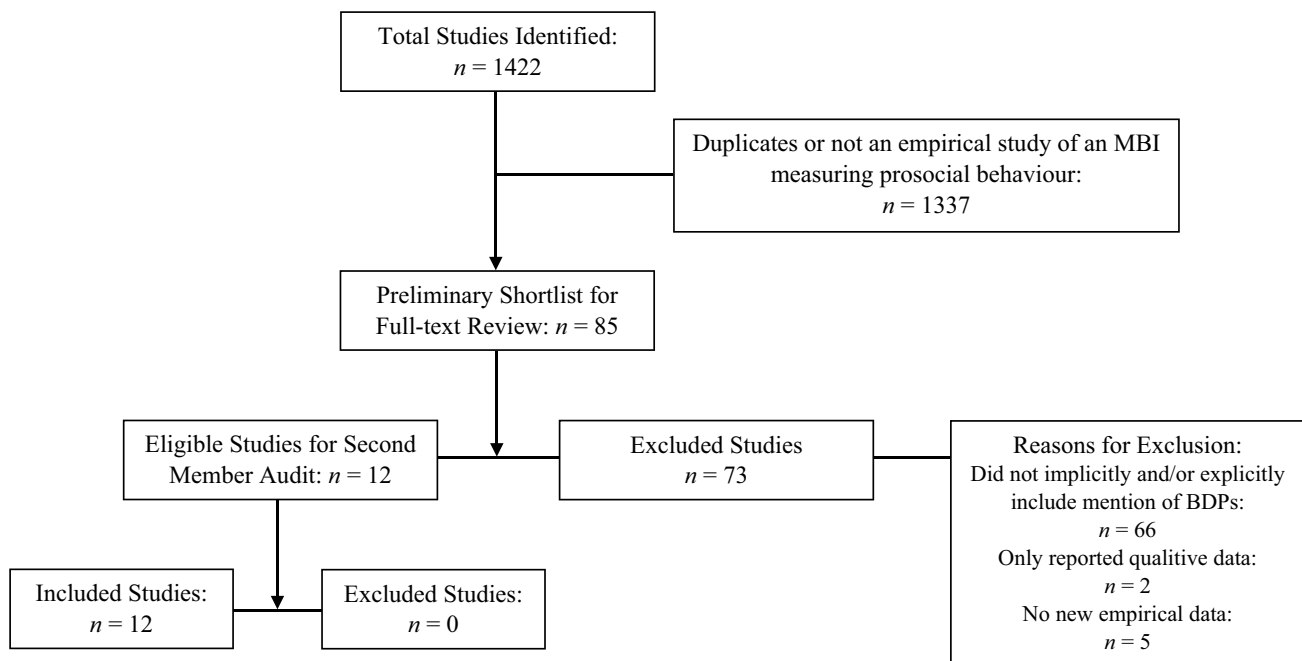


Fig. 1 PRISMA flow diagram of the paper selection process

specifically stated the MBI comprised purely present-centred awareness practices and provided adequate explanation of intervention details accordingly (e.g., Berry et al., 2018; Dixon et al., 2019; Heppner et al., 2008). However, other studies did not provide adequate information on the specifics of the MBI, causing it to be unclear whether Wisdom-Based practices were used during the interventions (e.g., Georgiou et al., 2020; Kirk & Montague, 2015; Winning & Boag, 2015). In such cases, an email was sent to the corresponding author of each study to confirm the details of the intervention. Other reasons for studies to be excluded were that they only reported qualitative data ( $n=3$ ) (e.g., Andreu et al., 2021; Shonin et al., 2014), or were overviews of previous studies, providing no new empirical data ( $n=4$ ) (e.g., Kang, 2019; Singer & Engert, 2019).

### Characteristics of Included Studies

Of the 12 papers that met the inclusion criteria, over 65% were published in the last 5 years, indicating a growing interest in exploring the connection between Wisdom-Based practices and prosocial behaviour within MBIs across varying contexts. Among the included studies, ten employed an RCT design, while the others used controlled designs such as non-randomized control trials. Of the 12 papers that met the inclusion criteria, the mean QATQS quality score was 1.25 ( $SD=0.45$ ), indicating a moderate to strong level of study quality. A total of 9 studies received a strong quality score, and 3 studies received a moderate quality score. Additionally, the total number of participants across all 12 studies was 2195 ( $M=182.92$ ,  $SD=182.08$ ).

The specific focus on incorporating Buddhist Wisdom-Based practices into an MBI distinguished the present paper from prior systematic reviews in this area. Due to this unique approach and the inclusion of non-randomized control trials, approximately 80% of the studies evaluated in this review were not covered in previous systemic reviews and meta-analyses focussed on investigating the impacts of MBIs on prosocial behaviour (Berry et al., 2020; Donald et al., 2019).

Table 2 provides a comprehensive overview of the quality and risk of bias of the included studies, study characteristics, intervention descriptions, measures for prosocial behaviour, and outcomes for each study included.

### How Prosocial Behaviour was Assessed and Measured

Prosocial behaviour was conceptualized in various ways across the included studies. The most prevalent approach involved evaluating prosocial behaviour as a shift in participants' desire to help unknown others (Böckler et al., 2018; Brito-Pons et al., 2018; Chen & Jordan, 2020; Montero-Marín et al., 2016; Xiao et al., 2020). Another frequently

adopted perspective considered prosocial behaviour as a modification in participants' empathetic response (Bayot et al., 2020; Chen & Jordan, 2020; Montero-Marín et al., 2016; Wallmark et al., 2013). Additionally, there was a noteworthy emphasis on assessing tangible expressions of prosocial behaviour, such as the actual donation of time, money, or possessions (Böckler et al., 2018; Chen & Jordan, 2020; Flook et al., 2015; Xiao et al., 2020). In contrast, some studies construed prosocial behaviour as participants' self-reported behavioural responses to hypothetical scenarios (Bayot et al., 2020; Böckler et al., 2018; Geiger et al., 2020). Furthermore, an alternative approach was employed in one study, where prosocial behaviour was understood as changes in participants' implicit prosocial responses (Bayot et al., 2020).

Additionally, prosocial behaviour was measured in various ways, with some studies employing multiple methods. More than 80% of the reviewed studies utilized psychometric questionnaires to measure prosocial behaviour, while approximately 25% of the studies incorporated tasks related to monetary donation or volunteering. Subsequently, over 15% of the studies employed interactive computer tasks, and a similar percentage used hypothetical scenarios to assess prosocial tendencies.

### The Impact on Prosocial Behaviour

The reviewed studies indicated that Wisdom-Based BDPs were applicable in influencing prosocial behaviour for individuals of different age groups (i.e., preschool students, university students, and adults), as well as individuals with varying levels of meditation experience (i.e., novice to advanced practitioners). Another noteworthy observation is that even incorporating brief Wisdom-Based practices into an MBI, such as 10 min of guided meditation per day for 6 days (Chen & Jordan, 2020) or a single 15-min guided meditation (Poulin et al., 2021), were found to have a positive impact on prosocial behaviour. Outcomes from the included studies also indicated that participating in weekly sessions for a duration of 8–13 weeks yielded positive effects on prosocial behaviour.

In general, the studies can be categorized by the different Wisdom-Based practices they incorporated into their MBIs. Namely, (1) contemplation of interdependence, (2) perspective taking on self and other, (3) both contemplation of interdependence and perspective taking on self and other, and (4) contemplating and intuiting emptiness (Table 2).

### MBIs Including Contemplation on Interdependence

Approximately 40% of the reviewed studies included contemplations on interdependence and/or interconnectedness as their primary Wisdom-Based practice (Brito-Pons et al.,

**Table 2** Description and Quality Assessment of Included Studies

Study	Participants and facilitators	Intervention description	Measures for prosocial behaviour	Outcomes	QATQS quality scoring
<b>MBIs including contemplation on interdependence (<math>n=5</math>)</b>					
Brito-Pons et al. (2018)	<p>Participants: Total: 82 CCT and control: Female: 50% Male: 50% CCT and MBSR: Female: 60% Male: 40% Age range: 19 to 74 Compassion Cultivation Training group (<math>n=26</math>) MBSR group (<math>n=32</math>) Waitlist control group (<math>n=24</math>) Facilitator: Clinical psychologists and experienced meditators</p>	<p>Overview: 9-week Compassion Cultivation Training including weekly 2-hr experiential classes. 30-min guided meditation practice at home each day 8-week MBSR including weekly 2.5-hr experiential sessions, a 7-hr intensive retreat between Sessions 6 and 7, and 40 to 60-min of daily guided meditation at home Wisdom-Based BDPs Embracing shared common humanity and appreciating the deep interconnectedness between the self and others (CCT Program Step 4)</p>	<p>Psychometric Questionnaires: The Compassion for Others Scale (CFO) (Pommier, 2011) to measure compassion towards others The Identification with All Humanity Scale (IWAH) (McFarland et al., 2012) measure of caring for all humanity as opposed to caring just for the ingroups The Interpersonal Reactivity Index (IRI) (Davis, 1980) to measure empathetic response Frequency: Pre-test, post-test and follow-up (2-months)</p>	<p>Significant increase in compassion for others in the CCT group, which was not observed in the control or MBSR group Significant increase in the identification with all humanity in the CCT group, whereas no such increase was found in the control or MBSR group Both the CCT and MBSR groups exhibited significant changes in the Perspective Taking and Personal Distress but only the CCT group exhibited these changes in the Empathetic Concern</p>	<p>Selection bias: 1 Design: 1 Confounders: 1 Blinding: 2 Data collection: 1 Attrition: 1 Global rating: Strong</p>
Flook et al. (2015)	<p>Participants: Total: 68 Novice meditators Female: 51.5% Male: 48.5% Medium age: 4.67 SD age: 0.27 Mindfulness-Based Kindness Curriculum (<math>n=30</math>) Waitlist Control Group (<math>n=38</math>) Facilitators: Experienced mindfulness instructors</p>	<p>Overview: 12-week Mindfulness-Based Kindness Curriculum (KC) consisting of two 20 to 30-min lessons per week, delivered during regular school hours. Included activities such as mindful breathing, listening and movement, as well as activities to promote kindness, compassion, and interconnection such as gratitude exercises, sharing activities, and empathy-building exercise Wisdom-Based BDPs Recognizing the interdependence of all people and the earth (Kindness Curriculum Theme 7)</p>	<p>Donation Task: Sharing Sticker Task (designed for use in the current study) to measure prosocial behaviour. Children were given 10 stickers at the beginning of each trial and told they could keep as many as they would like for themselves and give as many as they would like to the other person Frequency: Pre-test and post-test</p>	<p>Significant increase in actual prosocial behaviour among participants in the KC group, as measured by their willingness to share resources with others Control group kept significantly more stickers for themselves over time relative to the KC group KC intervention had a stronger positive effect on prosocial behaviour for children with lower baseline executive functioning</p>	<p>Selection bias: 2 Design: 1 (randomized control trial) Confounders: 1 Blinding: 2 Data collection: 1 Attrition: 1 Global rating: Strong</p>

Table 2 (continued)

Study	Participants and facilitators	Intervention description	Measures for prosocial behaviour	Outcomes	QATQS quality scoring
Chen and Jordan (2020)	<p>Participants: Total: 621 Female: 76% Male: 24% Medium age: 18.64 SD age: 1.88 EthicalM: <math>n = 207</math> SecularM: <math>n = 206</math> Control Group: <math>n = 208</math></p> <p>Facilitators: Online recording adapted from Creswell et al. (2014)</p>	<p>Overview: 6-day Ethical Mindfulness and Secular Mindfulness brief MBI. 10-min online guided meditations or control exercises practiced each day. All exercises, including the analytical thought control, were presented as mindfulness exercises to control expectations</p> <p>Wisdom-Based BDPs: Interdependence of all beings (EthicalM Session 2, 3, 4, 5, 6) Ethics-Based BDPs: No-harm (EthicalM Session 2, 3, 4, 5, 6)</p>	<p>Monetary Donation Task: Habitat for Humanity (HfH) Experiment to measure prosocial behaviour through monetary donations. At the end of the MBI, participants were invited to read an article about a mother struggling with homelessness. They were then given the opportunity to donate their compensation money (\$15 Canadian) to a related charity (HfH)</p> <p>Psychometric Questionnaires: Compassionate Goals Scale (Crocker &amp; Canevello, 2008) to measure compassionate goals that contribute to another's well-being</p>	<p>EthicalM participants were significantly more likely to make a charitable donation than SecularM participants</p> <p>EthicalM participants also donated significantly more money compared to the SecularM group</p> <p>SecularM participants donated less than Control Group participants</p> <p>Findings suggest that the ethical focus of the EthicalM training may have encouraged participants to see their interconnectedness, which may have increased their willingness to donate to a charitable cause</p>	<p>Selection bias: 1 Design: 2 (Randomized Control Trial) Confounders: 2 Blinding: 2 Data collection: 1 Attrition: 2 Global rating: Strong</p>
Geiger et al. (2020)	<p>Participants: Total: 153 Study 1: University Students sMBI Group (<math>n = 37</math>) Waitlist Control Group (<math>n = 39</math>) Study 2: Company Employees sMBI Group (<math>n = 37</math>) Waitlist Control Group (<math>n = 40</math>)</p> <p>Facilitators: Experienced mindfulness trainers</p>	<p>Overview: 8-week sustainably-adapted MBI (sMBI) including weekly 2.5-hr sessions (90-minutes for Study 2), a half-day retreat after the sixth week, and daily individual practice of 40 to 60-min (20-min for Study 2). The sMBI is a modified version of the MBSR to include exercises for promoting sustainable consumption, such as exploring the environmental and socioeconomic impacts of nutritional and clothing consumption</p> <p>Wisdom-Based BDPs Mention of interdependence and co-dependent arising (sMBI Session 7)</p>	<p>Psychometric Questionnaires: Sustainable Consumption Behaviour Scale (SCB) (Geiger &amp; Keller, 2018) using the SCB-nutrition and SCB-clothing subscales to measure both environmental and socioeconomic impacts of nutritional and clothing consumption behaviours</p> <p>Frequency: Pre-test and post-test</p>	<p>No significant differences in sustainable consumption behaviours between the Intervention and Control Groups for both university students and employees</p> <p>Preliminary evidence suggesting that the sMBI might indirectly influence pro-environmental behaviour through changes in material values</p>	<p>Selection bias: 1 Design: 1 (randomized control trial) Confounders: 2 Blinding: 2 Data collection: 1 Attrition: 1 Global rating: Strong</p>



Table 2 (continued)

Study	Participants and facilitators	Intervention description	Measures for prosocial behaviour	Outcomes	QATQS quality scoring
Poulin et al. (2021)	<p><b>Participants:</b> Total: 325 Female: 30% Male: 70% Other: &lt; 1% Medium age: 19.16 SD age: 1.38 Independent self-construal group Interdependent self-construal group</p>	<p><b>Overview:</b> Pre-recorded 15-min online guided mindfulness meditation adapted from Arch and Craske (2006). Before the meditation participants were primed using a Pronoun-Circling Task, where they read a paragraph about a trip to the city written in either the singular (e.g., "I went to the city") or plural form (e.g., "We went to the city") Wisdom-Based BDPs Primed with interdependent self-construals before the meditation</p>	<p><b>Volunteering Task:</b> Volunteering Activity (designed for use in the current study) to measure prosocial behaviour through participants willingness to make a specific time commitment in which to volunteer to raise money for a charity</p>	<p>A significant decrease in prosocial behaviour among participants primed with independence A significant increase in prosocial behaviour among those primed with interdependence Odds ratios showed that the mindfulness intervention led to a 33% decrease in the odds of volunteering among participants primed with independence Odds ratios showed that the mindfulness intervention led to a 40% increase in the odds of volunteering among those primed with interdependence</p>	<p>Selection bias: 1 Design: 1 (randomized control group) Confounders: 2 Blinding: 2 Data collection: 1 Attrition: 1 Global rating: Strong</p>
MBIs including perspective taking on self and others ( $n = 3$ )					
Böckler et al. (2018)	<p><b>Participants:</b> Total: 332 Novice meditators Female: 54% Male: 46% Medium age: 40.74 SD age: 9.24 Training Cohort 1: <math>n = 80</math> Training Cohort 2: <math>n = 81</math> Training Cohort 3: <math>n = 81</math> Control Cohort 1: <math>n = 30</math> Control Cohort 2: <math>n = 60</math> <b>Facilitator:</b> Experienced meditation teachers</p>	<p><b>Overview:</b> Three different training modules (Presence, Affect, and Perspective), that began with a 3-day intensive retreat and continued with 13 weeks of individual 30-min daily home practice accompanied by a weekly 2-hr group session The Presence module: Focus: present-moment and interoceptive awareness The Affect module: Focus: socio-affective and motivational skills through The Perspective module: Focus: meta-cognitive skills and perspective taking on self and others Wisdom-Based BDPs Perspective talking on self and others (implicit interconnectedness/no-self)</p>	<p><b>Game Theoretical Paradigms:</b> Dictator Game (DG) (Camerer, 2003) <b>Interactive Computer Task:</b> Zurich Prosocial Game (ZPG) (Leiberg et al., 2011) <b>Donation Task</b> Hypothetical Distribution <b>Tasks:</b> Social Value Orientation scale (SVO) (Van Lange, 1999) Psychometric Questionnaires: Prosocialness Scale (Caprara et al., 2005) <b>Frequency:</b> Pre-test (T0) and post-test (T1, T2 and T3)</p>	<p>The Affect module trainings directly impacted altruistic motivations underlying prosocial behaviour No significant increase in altruistic behaviour was observed due to the Presence module, indicating that practices focusing only on present-moment attention are not efficient in altering altruistic motivations The Perspective module was also unable to demonstrate a significant increase in altruistic behaviour The intervention order of Presence-Affect-Perspective (P-A-P) led to significantly higher improvements in prosocial behaviour compared to those following the Presence-Perspective-Affect (P-P-A) sequence</p>	<p>Selection bias: 1 Design: 1 Confounders: 2 Blinding: 2 Data collection: 1 Attrition: 1 Global rating: Strong</p>

Table 2 (continued)

Study	Participants and facilitators	Intervention description	Measures for prosocial behaviour	Outcomes	QATQS quality scoring
Hildebrandt et al. (2017)	<p>Participants: Total: 332 Novice meditators Female: 54% Male: 46% Medium age: 40.74 SD age: 9.24 Training Cohort 1: <math>n = 80</math> Training Cohort 2: <math>n = 81</math> Training Cohort 3: <math>n = 81</math> Control Cohort 1: <math>n = 30</math> Control Cohort 2: <math>n = 60</math> Facilitator: Experienced meditation teachers</p>	<p>Overview: Three different training modules (Presence, Affect, and Perspective), that began with a 3-day intensive retreat and continued with 13 weeks of individual 30-min daily home practice accompanied by a weekly 2-hr group session The Presence module: Focus: present-moment and interoceptive awareness The Affect module: Focus: socio-affective and motivational skills through The Perspective module: Focus: meta-cognitive skills and perspective taking on self and others Wisdom-Based BDPs Perspective talking on self and others (implicit interconnectedness/no-self)</p>	<p>Psychometric Questionnaires: Compassion Scale (CS) (Raes et al., 2011) consists of 6 subscales: kindness, indifference, common, separation, mindfulness, and disengagement Compassion for Others Scale (CFO) (Pommier, 2011) utilizing the Common Humanity subscale to measure compassion and connection towards others Frequency: Pre-test (T0) and post-test (T1, T2 and T3)</p>	<p>The Affect module led to consistent increases in ratings of Common Humanity compared to other modules Basic attention exercises and mindfulness build the foundation for other meditation practices in complementary and reinforcing ways Warned against using breath-focused meditation practices alone to bring about changes in compassion, cooperation, or other ethical behaviours</p>	<p>Selection bias: 1 Design: 1 Confounders: 2 Blinding: 2 Data collection: 2 Attrition: 1 Global rating: Strong</p>
Wallmark et al. (2013)	<p>Participants: Total: 42 Female: 86% Male: 14% Medium age: 33.8 SD age: 13 MBI Group: 20 Waiting list Control Group: 22 Facilitator: Experienced meditation facilitators</p>	<p>Overview: 9-week MBI focused on <i>Tong-len</i> meditation which combines the <i>Brahmavihāras</i> with mindfulness of breathing. Including weekly 75-min sessions and guided meditations to practice at home Wisdom-Based BDPs Cultivating altruistic motivation and universal compassion, through taking the perspective of others (MBI Session 8)</p>	<p>Psychometric Questionnaires: The Interpersonal Reactivity Index (IRI) (Davis, 1980) to measure empathetic response Frequency: Pre-test and post-test</p>	<p>A significant increase in empathy and altruistic orientation among the meditation intervention group A strong positive correlation between changes in the Perspective Taking subscale of the IRI and changes in the mindfulness facet of non-reactivity, as well as a negative correlation with changes in perceived stress</p>	<p>Selection bias: 2 Design: 1 (RCT with control list) Confounders: 2 Blinding: 3 Data collection: 1 Attrition: 1 Global rating: Moderate</p>

Table 2 (continued)

Study	Participants and facilitators	Intervention description	Measures for prosocial behaviour	Outcomes	QATQS quality scoring
MBIs including both interdependence and perspective taking on self and others ( $n = 3$ )					
Bayot et al. (2020)	<p>Participants: Total: 78 Novice meditators Female: 78% Male: 22% Medium age: 38.07 SD age: 10.48 EMT Group: <math>n = 22</math> SMT Group: <math>n = 25</math> Control Group: <math>n = 31</math></p> <p>Facilitators: Licensed psychologists with 2–5 years of experience in group therapy and mindfulness teaching</p>	<p>Overview: 8-week Standardized Mindfulness Training and Ethics-oriented Mindfulness Training. Weekly classes of 120 min. Daily audio guided home practices Wisdom-Based BDPs: Contemplation upon interdependence and common humanity (EMT Session 2) Contemplation upon the notions of self and identity (EMT Session 7) Ethics-Based BDPs: Contemplation upon the <i>Brahmavihārās</i> (EMT Session 3, 4, 5, 6)</p>	<p>Interactive computer task: The Cyberball Paradigm (CB) (Williams &amp; Jarvis, 2006) to measure implicit prosocial responding Psychometric Questionnaires: The Vicarious Distress Questionnaire (VDQ) (Grynsberg et al., 2012) for self-reported measures of behaviour responding The Interpersonal Reactivity Index (IRI) (Davis, 1980) to measure empathetic response Pre-test, post-test and follow-up (3-months)</p>	<p>EMT participants exhibited a significant increase in empathy while only the SMT group showed a significant increase in implicit prosocial responding Findings suggest that empathy and prosocial behaviour may not always be linked, and that SMT alone might be sufficient to increase prosocial behaviour</p>	<p>Selection bias: 1 Design: 1 (Three-Arm Randomized Control Trial) Confounders: 2 Blinding: 2 Data collection: 1 Attrition: 1 Global rating: Strong</p>
Xiao et al. (2020)	<p>Participants: Total: 99 Female: 76% Male: 24% Medium age: 18.90 SD age: 0.92 Mindfulness Group: <math>n = 49</math> Waitlist Control Group: <math>n = 50</math></p> <p>Facilitator: Experienced mindfulness facilitator</p>	<p>Overview 11-week Mindfulness-Based Self Exploration (MBSC) course including weekly 150-min sessions and daily home practice. The course is divided into two modules the first, to cultivate mindful awareness of the breath, body, thoughts, and emotions; the second, to cultivate awareness of the interconnected nature of self and other Wisdom-Based BDPs Cultivation of self-other connections with an attitude of compassion and perspective of common humanity (MBSC course Week 9)</p>	<p>Hypothetical Scenarios: Prosocial Scenarios to measure the effect of mindfulness practice on willingness to help others and frequency of helping Psychometric Questionnaires: Revised (PTM-R) to measure prosocial tendencies in a Chinese context Chinese Interpersonal Reactivity Index (C-IRI) (Davis, 1980) to measure empathy and empathetic ability Moral Identity Scale (MIS) (Xu &amp; Ma, 2014) to measure moral traits</p>	<p>No significant difference in prosocial tendencies and empathy between the control group and the mindfulness group A significant decrease in the willingness to engage in prosocial behaviour in the control group, which was not observed in the mindfulness group Findings suggest that an individual's personal beliefs, values, and moral traits may influence the effectiveness of an MBI in promoting prosocial behaviour</p>	<p>Selection bias: 1 Design: 1 (randomized control trial) Confounders: 1 Blinding: 2 Data collection: 1 Attrition: 2 Global rating: Strong</p>

Table 2 (continued)

Study	Participants and facilitators	Intervention description	Measures for prosocial behaviour	Outcomes	QATQS quality scoring
Montero-Marin et al. (2016)	<p>Participants: Total: 38 Experienced meditators Medium age: 52.63 SD age: 9.88 Vipassanā meditation retreat: <math>n = 19</math> Control Group: <math>n = 19</math></p>	<p>Overview: 1-month silent Vipassanā meditation retreat with an average daily practice of 8 to 9 hr, that adhered to a vegetarian diet. Participants meditated together during Weeks 1 and 4, and individually in their own rooms during Weeks 2 and 3 Wisdom-Based BDPs: Vipassanā as a practice to develop insight into the impermanent, selfless, and interconnected nature of all phenomena</p>	<p>Psychometric Questionnaires: Temperament and Character Inventory-Revised (TCI-R) (Cloninger, 1993) to measure cooperativeness and reward dependence Frequency: Pre-test and post-test</p>	<p>Meditation retreat group showed a significant increase in cooperativeness, which refers to compassion, acceptance, and identification with others Meditation retreat group showed a significant decrease in reward dependence, which is associated with a reduction in the need for the approval of others Findings suggest an increase in prosocial tendencies among the retreat group participants</p>	<p>Selection bias: 2 Design: 3 (controlled non-randomized trial) Confounders: 2 Blinding: 2 Data collection: 1 Attrition: 1 Global rating: Moderate</p>
MBIs including contemplation on emptiness ( $n = 1$ ) Van Gordon et al. (2019)	<p>Participants: Total: 25 Advanced meditators Average Years Meditation Experience = 25.32 (<math>SD = 9.21</math>) Female: 76% Male: 24% Medium age: 52.32 SD age: 7.59 Emptiness Meditation: <math>n = 25</math> Control Group Mindfulness Meditation: <math>n = 25</math> Facilitators: Advanced meditators' individual practice</p>	<p>Overview: Participants were instructed to engage in a meditation that led to the perception of emptiness, with an average meditation of 76.2 min. The control group were instructed to participate in least 45-min of formal seated Mindfulness Meditation Wisdom-Based BDPs: The Buddhist wisdom principle of emptiness</p>	<p>Psychometric Questionnaires: Santa Clara Brief Compassion Scale (SCBCS) (Hwang et al., 2008) to indirectly measure prosocial behaviour by recording the generation of empathic feelings and desire to help unknown others Frequency: Participants were requested to complete psychometric scales no more than 24 hr prior to the meditation (pre-test), and then once more within 24 hr after the meditation (post-test)</p>	<p>Both the Emptiness Meditation on emptiness Mindfulness Meditation were associated with significant increases in the desire to help unknown others The increase was significantly higher for the Emptiness Meditation compared to the Mindfulness Meditation control condition, suggesting that Emptiness Meditation may be more effective in enhancing compassion and prosocial tendencies</p>	<p>Selection bias: 2 Design: 3 (within-participant control condition) Confounders: 2 Blinding: 2 Data collection: 1 Attrition: 1 Global rating: Moderate</p>

2018; Chen & Jordan, 2020; Flook et al., 2015; Geiger et al., 2020; Poulin et al., 2021). Among these interventions, three included the Wisdom-Based practice of interdependence alongside Ethics-Based practices such as Compassion Meditation (Brito-Pons et al., 2018), kindness and gratitude exercises (Flook et al., 2015), and no-harm principles (Chen & Jordan, 2020), while two studies incorporated the practice in isolation from Ethics-Based practices (Geiger et al., 2020; Poulin et al., 2021).

Firstly, the study by Brito-Pons et al. (2018) compared an MBI that included Concentration-, Ethics-, and Wisdom-Based practices (Compassion Cultivation Training; CCT), with an MBI that only included Concentration-Based practices (Mindfulness-Based Stress Reduction; MBSR). Findings revealed a significant increase in “compassion for others” and “identification with all of humanity” in participants of the CCT group which was not observed in the control or MBSR group. These results suggest that the inclusion of Ethics- and Wisdom-Based practices within an MBI may enhance prosocial orientation compared to MBIs which do not include them. However, as both “compassion for others” and “identification with all of humanity” increased during the intervention, it is unclear whether the underlying mechanism for prosocial behaviour is increased compassion or increased interdependence.

Similarly, Flook et al. (2015) investigated the effects of an MBI including Concentration-, Ethics-, and Wisdom-Based practices (the Mindfulness-Based Kindness Curriculum), on the prosocial behaviour of preschool children. Results revealed a significant increase in actual prosocial behaviour (as measured by their willingness to share resources with others) among participants in the intervention group. These positive effects were particularly evident in participants with lower baseline executive functioning, such as lower social competence and cognitive ability. However, due to the nature of the study’s design, it is unclear whether the impact on prosocial behaviour resulted from the inclusion of Concentration-, Ethics-, or Wisdom-Based practices.

Although the previous studies had a positive effect on prosocial behaviour, the underlying mechanisms for this change were unclear. Results from Chen and Jordan’s (2020) study help address this issue whereby participants of an Ethical Mindfulness intervention (EthicalM; an MBI including Concentration-, Ethics-, and Wisdom-Based practices) were significantly more likely to make charitable donations and donate more money compared to participants of a Secular Mindfulness intervention (SecularM; an MBI only including Concentration-Based practices). Interestingly, the same study found that SecularM participants donated less than Control Group participants which, as Chen and Jordan (2020) suggest, demonstrates how MBIs only including Concentration-Based practices may decrease prosocial behaviour for certain participant groups (i.e., individuals

with low trait empathy). Notably, the study found no significant differences between groups in compassionate goals during the intervention. This potentially suggests that the underlying mechanism for participants increased prosocial behaviour was not connected to changes in compassion but rather correlated with fostering a sense of interdependence with others (Chen & Jordan, 2020).

This proposition was further explored by the studies by Geiger et al. (2020) and Poulin et al. (2021), which attempted to isolate the causal relationship between MBIs and prosocial behaviour by only including Wisdom-Based practices (and not Ethics-Based practices) into their interventions. Firstly, the incorporation of contemplating the interdependence of all phenomena into a sustainably adapted MBI showed no significant difference on pro-environmental and sustainable consumption behaviours (Geiger et al., 2020). This finding suggests that the inclusion of interdependence alone into an MBI may be insufficient in positively influencing prosocial behaviour. However, the sustainably adapted MBI only included mention of interdependence as a minor part of the intervention, being introduced just once in week 7 of an 8-week intervention. Consequently, there might have been insufficient time allotted for the Wisdom-Based practice to exert an influence on behavioural outcomes. Conversely, when interdependence was included as a foundational part of the intervention, with participants being primed with it before engaging in a guided Mindfulness Meditation, there was a significant increase in prosocial volunteering behaviours (Poulin et al., 2021). Notably, Poulin et al. (2021) also found that when participants were primed with independence before engaging in the meditation, there was a significant decrease in prosocial behaviour.

In summary, results from these studies indicate that incorporating the Wisdom-Based practice of contemplating interdependence into MBIs, if given sufficient time, can have a positive impact on participants’ prosocial outcomes. On the other hand, studies also suggested that if MBIs do not include such practices (Chen & Jordan, 2020) or include practices emphasizing independence (Poulin et al., 2021), there is potential to negatively impact behaviour, further supporting the idea that interdependence with others serves as an underlying mechanism for prosocial behaviour.

### MBIs Including Perspective Taking on Self and Others

Around 25% of the included studies primarily incorporated the Wisdom-Based practice of perspective taking on self and others (Böckler et al., 2018; Hildebrandt et al., 2017; Wallmark et al., 2013). Among these, one study included perspective taking on self and others alongside the Ethics-Based practice of Compassion Meditation (Wallmark et al., 2013), while the other two studies attempted to separate the inclusion of Concentration-, Ethics-, and Wisdom-Based

practices in an effort to explore the underlying mechanisms of specific salutary outcomes (Böckler et al., 2018; Hildebrandt et al., 2017).

Firstly, results from an intervention that combined a type of Compassion Meditation with the Wisdom-Based practice of taking the perspective of others found a significant increase in empathy and altruistic motivation among participants (Wallmark et al., 2013). Notably, the findings indicated a positive correlation between participants' ability to adopt the perspective of others, with the ability to offer non-judgmental kindness, which as Wallmark et al. (2013) suggest may contribute to the development of altruistic prosocial behaviour. However, as the intervention combined both Ethics-Based and Wisdom-Based practices, it is unclear which meditative technique was the cause of these salutary outcomes.

Accordingly, Böckler et al. (2018) and Hildebrandt et al. (2017) isolated different meditation practices by categorizing them in a similar way to Table 1, with a Presence module focussed on attentional processes (closely relating to Concentration-Based practices), an Affect module focussed on socio-affective processes (closely relating to Ethics-Based practices), and a Perspective module focussed on meta-cognitive processes (closely relating to Wisdom-Based practices). Böckler et al. (2018) found that Ethics-Based practices (Affect module) directly influenced the underlying altruistic motivations that drive prosocial behaviour which were not found in other modules. Similarly, the analysis by Hildebrandt et al. (2017) suggested that Ethics-Based practices (Affect module) led to consistent increases in ratings of Common Humanity compared to other modules. This implies that Ethics-Based practices may play a more causative role in enhancing prosocial behaviour, through the development of altruism and a feeling of shared humanity, compared to the Wisdom-Based practice of perspective taking on self and others.

Additionally, although not a primary research objective, the findings by Böckler et al. (2018) suggest that the order in which Concentration-, Ethics-, and Wisdom-Based practices are implemented within an MBI may have a differential effect on participants. For example, there were significantly higher improvements in participants' prosocial behaviour in a game theoretical paradigm (the Dictator Game; Camerer, 2003) when they were subjected to the meditation techniques in the sequential order of Concentration-, Ethics-, and Wisdom-Based practices, compared to Concentration-, Wisdom-, and Ethics-Based practices. These results indicate that the optimal impact on prosocial behaviour may stem from a particular combination of diverse meditation practices.

In summary, although not all the studies agreed whether it was Ethics- or Wisdom-Based practices, or a combination of the two, that led to the development of altruism and a feeling of shared humanity, there was a consensus that increased

altruistic motivations and sense of common humanity were driving factors in the promotion of prosocial behaviour.

### **MBIs Including Both Interdependence and Perspective Taking on Self and Others**

An additional 25% of the included studies incorporated the Wisdom-Based practices of both interdependence and perspective taking on self (Bayot et al., 2020; Montero-Marín et al., 2016; Xiao et al., 2020). Among these, one study included the Wisdom-Based practices alongside Ethics-Based practices (Bayot et al., 2020), while the other two isolated the Wisdom-Based practices in their respective interventions (Montero-Marín et al., 2016; Xiao et al., 2020).

Firstly, the study by Bayot et al. (2020) comparing an MBI including Concentration-Based practices (Standardized Mindfulness Training) with an MBI including Concentration-, Ethics-, and Wisdom-Based practices (Ethics-oriented Mindfulness Training) found that that only participants of the Ethics-oriented Mindfulness Training demonstrated a significant increase in their ability to empathize with others. However, only participants in the Standardized Mindfulness Training group showed a significant increase in implicit prosocial responding, suggesting that there may not necessarily be a causal link between empathy and prosocial behaviour.

Similarly, results from a study that incorporated the Wisdom-Based practices of contemplating interdependence and the nature of self and others into an MBI (Mindfulness-Based Self Exploration Course) found that there was no significant difference in changes in empathy of the intervention group compared to the control group (Xiao et al., 2020). However, there was a significant decrease in the willingness to engage in prosocial behaviour in the control group, which was not observed in participants of the Mindfulness-Based Self Exploration Course. These findings further suggest that changes in prosocial behaviour may not solely correlate with changes in empathy, but other mechanisms, such as a heightened sense of interdependence with others, may serve as an underlying cause. Notably, Xiao et al. (2020) also found that the Mindfulness-Based Self Exploration Course had a significant impact on willingness to engage in prosocial behaviour but only for participants with above-average scores on moral identity, suggesting that an individual's personal beliefs, values, and moral traits may also influence the effectiveness of an MBI in promoting prosocial behaviour.

Unlike the studies by Bayot et al. (2020) and Xiao et al. (2020), which only incorporated the Wisdom-Based practices for 1 week each per their respective 8- and 11-week MBIs durations, the study by Montero-Marín et al. (2016) included contemplations on interdependence and selflessness as integral parts of the intervention. This study compared participants engaging in purely a Concentration-Based meditation

practice (Mindfulness Meditation) with those engaged in both Concentration- and Wisdom-Based practices (Insight Meditation). The results indicated that only participants in the Insight Meditation group exhibited a significant increase in compassion, acceptance, and identification with others, which, as Montero-Marín et al. (2016) assert, may be linked to the subsequent significant decrease in reward dependence and the potential increase in prosocial tendencies.

In summary, the findings suggest that a growing sense of interdependence rather than empathetic concern may be a causal condition for prosocial behaviour. Additionally, there is evidence to indicate that an individual's personal beliefs, values, and moral traits, as well as the extent in which Wisdom-Based practices are integrated into an intervention, may influence the effectiveness of an MBI in enhancing prosocial tendencies.

### MBIs Including Contemplation on Emptiness

Finally, only one study included a Wisdom-Based practice specifically related to the contemplation and intuition of emptiness (Van Gordon et al., 2019). The study by Van Gordon et al. (2019) compared advanced Buddhist meditation practitioners who were either subjected to an intervention incorporating Concentration-Based practices (Mindfulness Meditation) or Wisdom-Based practices (Emptiness Meditation). Results indicated that while both groups were associated with increases in the desire to help unknown others, the increase was significantly higher for participants of the Emptiness Meditation intervention. The reason for this, as proposed by Van Gordon et al. (2019), was that participants of the Emptiness Meditation experienced “Compassionate Farsightedness” (a state of oneness), which led to spiritually meaningful insights and the enhancement of compassion and prosocial tendencies. However, it was acknowledged that the experience of emptiness is an advanced meditative practice which may not be achievable for novice or intermediate meditators without appropriate tuition and training.

## Discussion

The present paper conducted a systematic review to examine MBIs incorporating Wisdom-Based meditation practices and their relationship to prosocial behaviour. Collectively, the findings suggest that MBIs incorporating the Buddhist wisdom practices of contemplating interdependence, emptiness, and perspective-taking on self and others may enhance prosocial behaviour through various mechanisms, such as (i) developing a sense of interdependence and common humanity, (ii) fostering the altruistic desire to help others, and (iii) experiencing a state of oneness.

Notably, the findings also suggest that empathetic concern may play a less important role in enhancing prosocial tendencies than previous studies propose (Berry et al., 2020), as both Bayot et al. (2020) and Xiao et al. (2020) found no correlation between changes in empathy with prosocial behaviour. Conversely, the present review reinforces the perspective that meditation practices contribute to prosocial behaviour by transforming an individual's perception of self. This transformation involves shifting from a rigid self that requires protection to one that is interdependent, flexible, and non-attached (Donald et al., 2019). Earlier research indicates that reduced attachment to the self correlates with a greater likelihood of responding helpfully to the needs of others (Berry & Brown, 2017), responding less defensively following perceived threats to the self (Niemiec et al., 2010), and demonstrating less intergroup bias (Lueke & Gibson, 2015). Moreover, the altruistic desire to help others could be connected to a decrease in reward salience (where reward is the focal consideration of the individual), diminishing the significance of obtaining a reward for engaging in helpful behaviour (Feruglio et al., 2022). This relationship might also be associated to a diminished attachment to self since there is no *I* or *me* requiring a specific reward, a concept supported by research conducted by Northoff and Hayes (2011) on the interplay between self and reward models.

The findings of this systematic review also receive theoretical support from the work of Bahl et al. (2016), who proposed a framework for behavioural transformation through mindful insight. According to their theory, mindfulness-based practices play a pivotal role in enhancing participants' attention, acceptance, and awareness of both internal and external stimuli. This heightened awareness prepares participants for insights into interdependence and self-transcendence, ultimately leading to transformative shifts in behavioural choices and actions.

Similarly, Leary and Diebels (2017) put forth a comparable theory concerning the correlation between mindfulness-based practices and their capacity to diminish egoistic thought, including self-preoccupation and values associated with self-enhancement. According to their perspective, a reduction in egoistic perspectives and the promotion of self-transcendent values, such as interdependence and oneness, are crucial factors in fostering overt generosity, as evidenced in considerate, responsible, and prosocial attitudes and behaviours.

However, while Bahl et al. (2016) and Leary and Diebels (2017) acknowledge the crucial role of insight into Buddhist wisdom principles in driving positive changes in prosocial behaviour, they do not explore the explicit need for Wisdom-Based practices within interventions to impart insight into such principles. Conversely, theory put forward by Monteiro et al. (2015) challenges this conception as they suggest the benefits of the modern mindfulness movement, categorized

by MBIs solely including Concentration-Based practices, are confined to the individual and may be unable to cultivate a sense of interdependence or have a wider impact on prosocial behavioural choices. The reason for this is that Concentration-Based practices serve to reinforce individuals' sense of self, rather than transcend it (Monteiro et al., 2015).

To address this issue, Van Gordon et al. (2019) offer a working model on the cultivation of emptiness (the transcendence of self) that can be incorporated into the structure of an MBI. The model suggests that initially, Concentration-Based practices are necessary to prepare and stabilize the mind. However, there is the subsequent need for Wisdom-Based practices to enable participants to perceive interdependence and oneness, ultimately leading to altered prosocial tendencies. Several of the studies included in this review seem to align with and provide support for this working model, particularly those that directly compared MBIs incorporating purely Concentration-Based practices with those including Wisdom-Based or a combination of Wisdom- and Ethics-Based practices. For example, Brito-Pons et al. (2018) indicated that when incorporating the Buddhist wisdom practice of contemplating interdependence within the intervention there was a significant positive impact on prosocial behaviour, while the studies by Chen and Jordan (2020) and Poulin et al. (2021) crucially found that the absence contemplating interdependence, or the inclusion of contemplating independence, led to a reduction in the prosocial behaviour of participants.

A potential explanation for this phenomenon can be found in traditional Buddhist teachings on mindfulness, such as those in the Mindfulness of Breathing or *Ānāpānasati Sutta*. The *Ānāpānasati Sutta* begins with Concentration-Based practices to stabilize the body and mind, before progressing onto Ethics-Based practices aimed at purifying the mind from unwholesome thoughts and emotions (Nhat Hanh, 1996). Finally, when the mind is both calm and pure, it becomes ready to engage in Wisdom-Based practices (Anālayo, 2019). Through this process, the practitioner is able to transition into a realm of non-duality and interdependence, which can lead to more compassionate and prosocial actions (Nhat Hanh, 2017).

This concept has been visually depicted as a sequential progression from Concentration-Based practices to Ethics-Based practices and, ultimately, to Wisdom-Based practices, leading to enhanced prosocial behaviour (Furnell et al., 2024). What stands out in this visual representation is how participants with particular personality traits, who are involved in MBIs that exclusively incorporate Concentration-Based practices, may exhibit a tendency towards developing antisocial behaviour. This aligns with the findings of Chen and Jordan (2020), suggesting that certain MBIs could potentially have a detrimental effect on the prosocial

behaviour of individuals with low trait empathy. Additionally, Xiao et al. (2020) propose that such interventions may not positively influence prosocial tendencies in participants with low to average scores on moral identity. This evidence underscores the notion that an individual's personality traits and moral identity can influence the effectiveness of a given MBI.

Additionally, the systematic review and meta-analysis by Donald et al. (2019) proposed that self-reported measures of prosocial tendencies may lead to inaccurate and inflated correlations between an MBI and its influence on prosocial behaviour due to social desirability and other biases. Similar concerns were raised during the present systematic review as all studies that employed multiple methods to measure prosocial behaviour (around one-third of the included studies) found a limited correlation between self-reported measures (such as psychometric scales) and behavioural-based indicators (such as volunteering tasks, donation tasks, or game theoretical paradigms). These findings raise further concerns about the reliability of self-reported measures in accurately assessing prosocial behaviour. Furthermore, it is worth noting that over 65% of the studies that included donation, volunteering, hypothetical scenarios, or interactive computer tasks had researchers design these tasks specifically for use within the intervention. This highlights a lack of standardized measures to assess actual prosocial behaviour, making it challenging to compare the effectiveness of different interventions in promoting prosocial behaviour.

Finally, several studies indicated that although the inclusion of Wisdom-Based practices can influence the outcomes of an intervention, the way in which the practices are integrated into an MBI may influence effectiveness for enhancing prosocial tendencies. These findings receive empirical support from the study by Zeng et al. (2023) which delves into the quality and quantity of meditation practices, suggesting that if meditation practices are superficially integrated into an MBI, their effectiveness will be limited compared to incorporating them as a meaningful part of the intervention. Likewise, it is imperative to thoughtfully integrate Wisdom-Based meditative practices into an MBI, recognizing their significance, rather than merely treating them as supplementary components.

## Limitations and Future Directions

Although the overall quality of the studies included in this systematic review received a mean QATQS rating of moderate to strong (1.25;  $SD = 0.45$ ), it is important to acknowledge and address the limitations identified in three specific studies which received moderate quality ratings. Firstly, the study of Van Gordon et al. (2019), despite demonstrating robust data collection and analysis, utilized a small sample size of 25 advanced Buddhist meditators along with a



within-participant control condition. The fact that the experience of emptiness is often considered to only be achievable for advanced meditation practitioners raises issues surrounding the suitability of including the Wisdom-Based practice for novice meditators. Additionally, the study by Monteiro et al. (2015), with its controlled non-randomized trial, introduced potential biases as participants self-selected into intervention groups, potentially impacting preferences and assessments. Lastly, the study by Wallmark et al. (2013) lacked clarity on participant and assessor blinding procedures, raising questions about safeguards against reporting bias. Despite these considerations, the collective findings contribute significantly to the understanding of meditation practices and their potential impact on prosocial behaviour.

Additionally, the sample size across the 12 included studies varied greatly, ranging from 25 to 621 participants. This wide variation in sample sizes may have impacted the comparability of results across the studies. Furthermore, the restriction to English language studies may have resulted in the exclusion of relevant empirical studies conducted in other languages. Likewise, the exclusion of unpublished and non-peer-reviewed papers may have overlooked potentially valuable evidence.

Based on this systematic review, the inclusion of Wisdom-Based BDPs in MBIs shows promise in promoting prosocial behaviour. The evidence suggests that these practices can enhance prosocial behaviour by (i) developing a sense of interdependence and common humanity, (ii) fostering the altruistic desire to help others, and (iii) experiencing a state of oneness. However, further research is needed to validate and expand on these initial findings.

Several of the included studies incorporated both Ethics-Based and Wisdom-Based practices into their interventions, posing challenges in identifying which meditation techniques specifically contributed to changes in prosocial behaviour. To enhance the understanding of the underlying causes of prosocial behaviour, future studies should isolate the effects of different meditation practices incorporated within MBIs. However, the current broad categorization of MBIs found in academic literature (such as First-Generation and Second-Generation MBIs) may lack the necessary nuance for meaningful comparisons between varying meditation practices within different interventions (Furnell et al., 2024). A clearer categorization that distinguishes between Concentration-Based, Ethics-Based, and Wisdom-Based practices within mindfulness literature and MBIs could provide a more precise understanding of the relationship between differing meditation practices and prosocial behaviour.

Furthermore, there is an increasing body of evidence indicating that self-reported measures may not provide an accurate representation of prosocial behaviour. In light of this, it is recommended that future studies assessing the impact

of MBIs on prosocial behaviour employ a range of diverse measures. This includes utilizing self-reported psychometric scales in conjunction with real-world morally relevant scenarios to offer a more comprehensive evaluation of the effects of a given intervention.

In guiding the implementation of future MBIs, it is also essential to acknowledge the preliminary findings suggesting that interventions exclusively centred on Concentration-Based practices might potentially lead to reduced prosociality and an increased perception of self-importance, particularly for individuals with specific personality traits or below-average scores for moral identity. To mitigate potential adverse effects on prosocial behaviour, it is advisable to incorporate Wisdom-Based practices into MBIs. Additionally, assessing participants' personality traits within an MBI is recommended to further explore and understand the implications of these findings, ensuring a more tailored and beneficial approach to mindfulness interventions.

**Author Contribution** Matthew Furnell: conceptualization, writing, figure and table creation. William Van Gordon: reviewing and editing. James Elander: reviewing and editing.

## Declarations

**Ethical Consideration** This is a systematic literature review. No ethical approval is required. Informed consent is not applicable. PRISMA guidelines were implemented throughout this review and methodological approaches were preregistered with PROSPERO (Reg No. CRD42023426411).

**Use of AI Statement** AI was not used for the writing or editing of this manuscript.

**Conflict of Interest** The authors declare no competing interests.

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