Appendix A - Characteristics of the studies included in the analysis

Study Author, Year, Country	Population N = Included (Completed/Follow-up), Age = Range (Mean), Gender, Target Group	Intervention Duration, Content	Comparators Duration, Content	Outcome Measurements, Tools	Time Intervention, Timings of Data Collection	Setting Location of Study Group
Owens et al (2024) United Kingdom	N = 20 (20) Age = (38.6) %female = 70.0 Study group: Adults recruited via social media advertisement	20 minutes listening to an audio script of Nature-Based Guided Imagery (GI) in small groups (max 3), for 3 times over 2 weeks, indoor. Encouraged to practice at least 3 times between the sessions.	20 minutes listening to an audio script of Nature-Based Meditation (NBM) in small groups (max 3), for 3 times over 2 weeks, outdoor. Encouraged to practice at least 3 times between the sessions.	well-being via Warwick Edinburgh Mental Weel-Being Scale (WEMWBS), self-compassion via Self-Compassion Scale (SCS-SF), *mindfulness* via Toronto *mindfulness* Scale (TMS) i.e. curiosity and decentering, rumination via Brief State Rumination Inventory (BSRI), affect vias Positive and Negative Affect Schedule (I-PANAS-SF), depressive symptoms via Patient Health Questionnarie (PHQ-8), nature connection via Nature Relatedness Scale (NR6)	T1 before the first intervention T2, T3, T4 immediately after first, second and third intervention	Group 1 indoor in a spacious, quiet private room in the university Group 2 outdoor in a quasi-natural space at the university in UK
Müller et al. (2024) Germany	N = 116 (111) Age = 29-65 (52.3) %female = 61 Study group: adult inpatients from two psychosomatic rehabilitation clinics in Germany, with depression diagnosis	Treatment As Usual (TAU) + *mindfulness*-based nature intervention 4 hours once a week for 3 weeks in open groups and relaxation-based nature intervention 4 hours once a week for 4 weeks in closed groups; small groups of maximum seven participants (min =2, max =7, median =5).	Treatment As Usual (TAU). This includes routinely spending time in nature (parks and forests around the clinics), without guided programs.	Primary: mood (PANAS-SF); secondary: depression (PHQ- 9), trait *mindfulness* (MAAS), state self-compassion (SSCS-S)	T1: Survey before intervention T2: immediately after intervention T3: 3 months after the intervention only for Nature-based *mindfulness* inpatients	parks and forests around the rehabilitation clinics in Germany

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Kang et al. (2023) Korea	N = 276 Age = 13-70 (54.9) %female = 73.9 Study group: individuals from 11 different institutions serving vulnerable populations nationwide in Korea recruited through advertisements and identified as belonging to one or more vulnerable groups based on the criteria developed to investigate Covid-19's impact	30-session gardening program, 2 hours per session, held twice a week for 15 weeks. Group size varied from 14 to 37 participants	NA	Depression (MHS:D); Anxiety Disorders (MHS:A); Stress (K-PSS); *mindfulness* (K-MAAS); Life Satisfaction (K-SWLS)	T1: Before intervention T2: After intervention	Gardens of the institutions in Korea
Zhu (2024) China	Study 1 - correlational N = 1448 Age = 16-28 (19.7) %female = 52.6 Study 2 N = 159 Age = 18-22 (18.5) %female = 54.0 Study 3 N = 87 (88) Age = 18-21 (18.5) %female = 68.6 Study 4 N = 355 Age = 18-25 (20.4) %female = 57.7 Study group: Chinese university students with problematic use of smartphone	Study 1: no intervention Study 2: recalling experiences in natural environments and the related feelings (lab experiment, one time) Study 3: brief exposure (5 minutes observation) of a natural environment, then description of the environment and of the feelings evoked Study 4: 2 weeks program "Noticing Nature Intervention", participants told to notice and be mindful of the natural elements / environments encountered and daily register in a diary the elements noted	Study 1: no intervention Study 2: recalling experiences in urban environments and the related feelings (lab experiment, one time) Study 3: brief exposure (5 minutes observation) of an urban environment, then description of the environment and of the feelings evoked Study 4: 2 weeks program, participants told to notice and be mindful of the human-built elements / environments encountered and daily register in a diary the elements noted. Control group was told to daily write the courses they studied	Study 1: Chinese version of Connectedness To Nature (CNS); Chinese version of *mindfulness* Attention Awareness Scale (MAAS); Chinese version of Smartphone Addiction Scale (SAS) Study 2: using smartphone desire 10-item questionnaire Study 3: using smartphone desire10-item questionnaire, 13-item state *mindfulness* questionnaire Study 4: Chinese version of Smartphone Addiction Scale (SAS)	Study 2, 3: T2 after intervention Study 4: T1 before intervention, T2 just after 2 weeks intervention	Study 1: no intervention Study 2: laboratory Study 3: park vs urban square Study 4: park and urban environments around the Chinese universities

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Schaller, Karing (2024) Germany	N = 30 (29, 30) Age = (23.0) %female = 83.1 Study group: university students in Germany recruited via social media and flyers at University	7-week *mindfulness*-based or nature programs, one session per week with 3 different conditions. The groups received: (1) a *mindfulness* app-only consisting of listening a 7 minutes *mindfulness* meditation audio indoor at home, (2) a nature-only intervention consisting in walking in the forest, sitting on a bench for 7 minutes without specific instruction, 3) a combined intervention consisting in going in the forest, sitting on a bench for 7 minutes and listening to the 7 minutes *mindfulness* meditation audio (same as 1).	NA	*mindfulness* via Five-Facet *mindfulness* Questionnaires (FFMQ); Life Satisfacion (Dalbert); Depression via Patients Health Questionnaire (PHQ-8), Anxiety via General Anxiety Disorder (GAD-7), Stress via Perceived Stress Scale (PSS-10)	T1: Before intervention T2: After intervention T3: followup 7 weeks after intervention	Group 1 indoor at home Group 2 and 3: forest nearby home in Germany
Chhajer and Hira (2024) India	N = 60 (60, 60) Age = 17-20 (17.5) %female = 51.1 Study group: students from urban secondary school in India	Participants attended either a PPI (Positive Psychology Intervention, based on PERMA model) or an MBI (*mindfulness* Based Intervention) in Nature for 5 days, 1h session per day supervised by a qualified facilitator.	Control Group received no intervention	Well-being (WHO-5), Gratitude (GAC), Nature in self (INS), Resilience (CD-RISC-10), Connection with self, others, and nature (Victorson et al. modified), Stress (PSS), Acting with awareness (FFMQ), Positive and negative affect (PANAS-20)	T1: Before intervention T2: Immediately after intervention	Natural outdoor *setting* of the secondary school premises in India
Lovern (2024) USA	N = 18 (16) Age = 28-43 (NA) %female = 68.8 Study group: university students in USA, in particular student registered nurse anesthetists	8 weekly 20-minute NBM sessions consisting in nature walking (5'), box breathing exercise (3'), and gratitude journaling (12') performed in a natural *setting*	NA	Depression, Stress and Anxiety Scale-21 (DASS-21)	T1: Before intervention T2: 1 week after intervention	Greenspaces located adjacent to the University's classroom in USA

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Macaulay et al (2024) Australia	N = 49 (55, 57, 54) Age = (24.3) %female = 74.0 Study group: adults recruited via online advertising university students and staff at University of Melbourne in Australia	20 minutes one time experience in nearby outdoor natural environment with instructions on how to engage with nature. Participants randomly allocated into (1) a group instructed to engage mindfully during their outdoor experience; (2) a group instructed to direct their attention in ways distinct from mindful qualities; (3) a group instructed to let their minds wander.	20min experience in nearby nature with no engagement instructions (unguided group)	Pre-test measures: trait nature connection, trait *mindfulness*, positive and negative affect, and the Sustained Attention to Response Task (SART). Post-test measures: SART, measures of positive and negative affect, state connection with nature, state *mindfulness* and state mind wandering, perceived restorativeness of the outdoor experience Tools: Connectedness to Nature Scale (CNS-7); Freiburg *mindfulness* Inventory (FMI-14); Freiburg *mindfulness* Inventory (FMI-14); Positive And Negative Affect Schedule (PANAS); Perceived Restorativeness Scale (PRS)	T1 just before intervention T2 just after intervention	Outdoor natural environment nearby home of participants in Australia
Yeo et al (2024) South Korea	N = 15 (15) Age = 40-69 (NA) %female = 93.3 Study group: middle-aged adults with little to no meditation experience recruited by posting notices at a Green Forest Healing Center in South Korea	Two sessions of 2-hour of forest healing meditation activities outdoor at the Forest of Healing; second session held two weeks after the first	Control group maintained their daily activities	Perceived Stress Scale (PSS), Positive and Negative Affect Schedule (PANAS), Self-Compassion Scale (SCS), Connection with Nature Scale (CNS), salivary cortisol	T1 before intervention T2 just after first intervention T3 after second intervention 2 weeks later	Forest in Korea

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Owens, Bunce (2023) United Kingdom	N = 76 Age = 18-25 (20.4) %female = 85.5 Study group: adolescents recruited among university students in United Kingdom	6 minutes virtual nature video combining immersive visual and auditory aspects of both green and blue space.	6 minutes real-world urban environment video combining visual and auditory aspects taken inside a London underground train during a busy rush hour period.	Short Warwickshire Edinburgh Mental Wellbeing Scale (SWEMWBS), International Positive and Negative Affect Schedule Short Form (I-PANAS-SF), Brief State Rumination Index (BSRI), Stress (VAS), Perceived Stress Scale (PSS-4), Nature Connection Index (NCI), Nature spirituality via Ecospirituality Scale	T1 before intervention T2 after intervention	NA
O'Meara et al (2024) Ireland	N = 48 (39) Age = 18-53 (22.7) %female = 68.8 Study group: university students recruited with university mailing list or in person in Ireland having high test anxiety (prescreening, 18 participants) or without prescreening (30 participants)	One bout of virtual nature self-administered consisting in 4 minutes 360-degree Virtual Reality video with a stationary view of a green environment viewed by participants using the VR headset provided by researchers.	4 minutes 360-degree Virtual Reality video with a stationary view of an urban environment viewed by participants using the VR headset provided by researchers.	Test Anxiety (PHCC TAQ), Positive and Negative Affect Schedule (PANAS), problem solving via Cognitive Reflection Test (CRT)	T1 just before intervention T2 just after intervention	At home
Keller et al (2024) USA	N = 24 Age = 16-18 (NA) %female = NA Study group: adolescents studying in a public high school in USA	3 forest bathing walks (90-min forest therapy sequence) over 3 weeks in natural environment	NA	Connectedness to Nature Scale (CNS)	T1 before intervention T2 after first intervention T3 after third intervention	Outdoor in three nature preserves nearby the school in USA
Keller et al (2023) USA	N = 24 Age = 16-18 (NA) %female = NA Study group: adolescents studying in a public high school in USA	3 forest bathing walks (90-min forest therapy sequence) over 3 weeks in natural environment	NA	Warwickshire Edinburgh Mental Wellbeing Scale (WEMWBS)	T1 before intervention T2 after first intervention T3 after third intervention	Outdoor in three nature preserves nearby the school in USA

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Blackmore et al (2024) Australia	N = 28 Age = 20-63 (40) %female = 60.7 Study group: adults with a primary diagnosis of major depressive disorder, bipolar disorder, or anxiety disorder	15 minutes virtual reality *mindfulness* practice wearing a VR headset presenting an omnidirectional video of a forest scene, overlaid with a guided audio voiceover	NA	*mindfulness* (Toronto *mindfulness* Scale), affect (Positive and Negative Affect Schedule), anxiety (State-Trait Anxiety Inventory)	T1 before intervention T2 after intervention	research rooms in a university *setting* in Australia
Reuver (2023) Netherlands	N = 229 Age = (16.9) %female = 25.8 Study group: adolescents – students recruited from two secondary school in the Netherlands	15-minutes nature-based guided imagery intervention in groups of 20 to 30 people. 2x2 between-participants design. Conditions include nearby versus wild nature, with and without social interaction Wild nature / non-social condition Wild nature / social condition Nearby nature / non-social condition Nearby nature / social condition	guided imagery intervention with no nature and no social interaction	Loneliness via De Jong-Gierveld Loneliness Scale, Nature Relatedness (NR-6), Imagination via Verbaliser-Visualiser Questionnaire by Kirby, Awe via Situational Awe Scale (SAS),	T1 before intervention T2 after intervention	Classroom within 2 high schools in The Netherlands
Torner et al (2024) Germany	N = 46 Age = 20-71 (41.4) %female = 94.4 Study group: Long/Post-COVID adult patients in Germany and Switzerland recruited through media	4 sessions within 2 consecutive weeks of a *mindfulness*-based forest bathing program; walks performed independently by all participants guided by 60-minute audio files	NA	Long/Post-COVID symptoms: Covid-19 Yorkshire Rehabilitation Scale (C19-YRS), Fatigue symptoms: Fatigue Assessment Questionnaire (FAQ), Physical and mental well-being: Short-Form Health Survey (SF-36), Stress-coping strategies: Stress-Coping Questionnaire (SVF-120), pulse rate	T1 before intervention T2 after intervention	Participants' nearby forests in Germany and Switzerland

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Joschko et al (2023) Germany	N = 20 Age = 18-27 (21) %female = 84.3 Study group: young psychosomatic (depressed) inpatients in Germany	4 weeks with 3 nature-based therapy sessions (group therapy held in the green) per week, each comprising 60 minutes, as part of the integrative therapy method at the Psychosomatic ward of the hospital	NA	Mental well-being (WOHL), Connectedness to nature scale (CNS), Patients health questionnaire (PHQ)	T1 = before the first session T2 = after 4-week stay at the hospital	Garden of the hospital or forest nearby, in Germany
Stephenson (2023) United Kingdom	N = 24 (12) Age = 13-19 (14.6) %female = 66.7 Study group: adolescents aged 13-19 with depressive symptoms in UK	4 weeks with outdoor 120 minutes psychoeducation group sessions about nature held 3 times per week in nature therapy local woods, parks and on school/college sites.	4 weeks with indoor 120 minutes psychoeducation group sessions held 3 times per week	Patient Health Questionnaire-9 (PHQ-9), Warwick-Edinburgh Mental Well-being Scale (WEMWBS), Generalised Anxiety Disorder-7 Assessment (GAD-7), Perceived Stress Scale-10 (PSS-10), Ruminative Responses Scale-10 (RRS-10), Nature Connection Index (NCI), Perceived Restorativeness Scale (PRS)	T1 before intervention T2 after 3 sessions T3 after intervention	local woods, parks and school gardens in United Kingdom
Simpattanawong (2024) Thailand	N = 30 Age = 18-23 (19.6) %female = 66.7 Study group: university students recruited at medical humanities department	1 hour forest bathing (FB) walks led by qualified FB and *mindfulness* in an urban tropical forest	1 hour guided mindful walking in a busy urban street in central Bangkok	Mood (POMS), Blood pressure, Heart rate variability	T1 before intervention T2 after intervention	urban tropical forest in Thailand
Queirolo et al (2024) Italy	N = 29 Age = (48.8) %female = 65.5 Study group: healthy adults in Italy	2 days fully immersed in a forest environment practising mindful walking, rest, contemplation, yoga practices, physical tree contact, meditation, and mantra chanting.	None	Heart rate (HR), heart rate variability (HRV), electrodermal activity (EDA), blood pressure (BP), immunoglobulin A (IGA), salivary cortisol (sCort), Perceived Stress Scale (PSS-10), Mental Arithmetic Task (MAT)	T1 = before intervention T2 = after intervention	Forest in Italy