

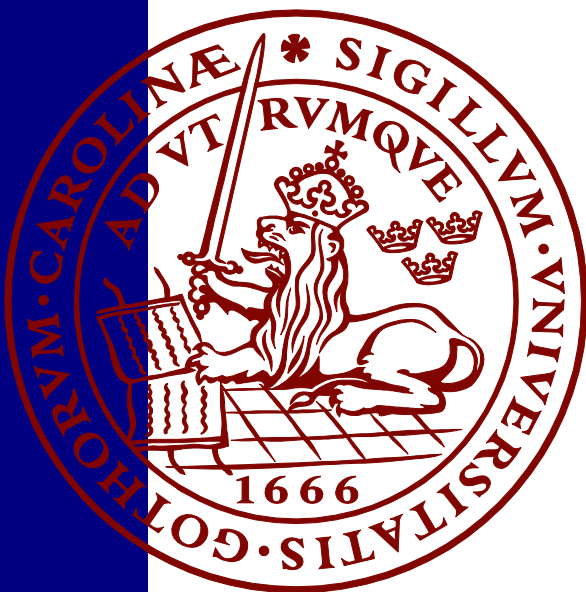
Are We Prepared for Eco-anxiety?

*A Systematic Review of Eco-anxiety Management Responses
and their compatibility with the mental-health application “Sensa”*

Anisha Tibdewal

Master Thesis Series in Environmental Studies and Sustainability Science,
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A thesis submitted in partial fulfillment of the requirements of Lund University
International Master’s Programme in Environmental Studies and Sustainability Science
(30hp/credits)



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Submitted May 8th, 2023

Supervisor: Sara Gabrielsson, LUCSUS, Lund University

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Abstract

Many people are struggling with eco-anxiety, a chronic fear of environmental doom. Currently, eco-anxiety is managed through face-to-face psychotherapy, but with a lack of eco-anxiety psychology specialists, mobile mental-health applications bring new possibilities. In this thesis, current psychological eco-anxiety management responses (EMRs) are thematically analysed through the lens of Integral Theory to identify alignment between mobile mHealth applications and EMRs, by using the mobile application "Sensa" as a case. A Systematic Literature Review method is used together with a qualitative screening of mental health responses from Sensa. Results show that while eco-anxiety could be managed with Sensa and similar mobile applications, an emphasis on emotion-focused coping and detachment techniques as responses could be detrimental. EMRs that are integral and equip people with flexible coping strategies should be incorporated. Findings illustrate that eco-anxiety management research should be prioritised in the context of global south, along with social, cultural and cross-sectional factors.

Keywords: Eco-anxiety management, mHealth, Integral Theory, mobile mental health applications, ecopsychology, Cognitive Behavioural Therapy (CBT), Sensa.Health

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List of Abbreviations

1. IPCC - Intergovernmental Panel on Climate Change
2. PTSD - Post-traumatic stress disorder
3. EMRs - Eco-anxiety Management Responses
4. MhMRs - Mental Health Management Responses
5. CBT - Cognitive Behavioural Therapy
6. WHO - World Health Organisation
7. SLR - Systematic Literature Review
8. AQAL - All quadrants, all levels, all lines, all states, all types
9. DPM - The Dual Process Model of Bereavement
10. ABCD - Asset-based Community Development

1 Introduction and Problem Definition

“Scholars of eco-anxiety have argued that instead of not caring, many people in fact care too much, and have to resort to psychological defences of denial and disavowal. Thus, the question ... is not anymore whether ... [we] should deal with [eco-] anxiety, for [eco-] anxiety is already there.” - Panu Pihkala (2017, p. 109)

We all have that one friend, colleague, politician or family member, who has said something similar to, “This is just another conspiracy theory, climate change is not real, and if it were, it's not our responsibility to deal with it.”, that left us feeling angry, resentful, frustrated or scared. Only recently, however, it has been found that whether in denial or angry or hopeful, most are struggling with a newly coined term called “eco-anxiety”, whether one believes it or not (APA & ecoAmerica, 2017; Coffey et al., 2021; Dodds, 2021; Pihkala, 2017).

Nevertheless, unlike depression or anxiety, eco-anxiety is not considered a psychological disorder in itself (Dodds, 2021). Instead, it is a natural reaction towards the observable devastation of nature and the environment and can also lead to pro-environmental behaviours (Dodds, 2021), therefore, rather than attempting to get rid of eco-anxiety, it has to be managed.

Although eco-anxiety is not a classified mental disorder (yet), there is a positive correlation between eco-anxiety and disorders like insomnia, PTSD, anxiety, depression, stress, etc. (Boluda-Verdú et al., 2022). This knowledge, combined with the need to manage eco-anxiety, necessitates the examination of how eco-anxiety can be dealt with alongside other mental health disorders. Similar concerns are highlighted in the latest IPCC report by Mukherji et al (2023); showing very high confidence in increasing climate-induced trauma and related mental health issues, increasing the importance for “improving surveillance and access to mental healthcare, and monitoring of psychosocial impacts from extreme weather events” (p. 74).

Currently, the most common method of managing eco-anxiety is by visiting a therapist, but the therapists may or may not be informed about how one must deal with eco-anxiety, as there is a severe lack of eco-anxiety psychology professionals (Baudon & Jachens, 2021). Another issue is that people require high financial resources in order to get in touch with a specialised eco-anxiety therapist, which is quite paradoxical, as the people worst impacted by eco-anxiety are the younger generations, the geographically marginalised and the impoverished (Baudon & Jachens, 2021; Chandrashekar, 2018; Coffey et al., 2021; Dodds, 2021). In addition, eco-anxiety is a complex issue

and can manifest differently in different individuals since each person's emotions and personality vary (Kurth & Pihkala, 2022). Consequently, the psychological strategies to manage eco-anxiety need to be analysed through a holistic perspective, in order to identify the most practical measures for a larger number of people (Duffy, 2020).

Nowadays, mental health mobile applications are increasingly sought after by people dealing with mental health issues (Chandrashekar, 2018). According to a Nature magazine feature by Anthes (2016), mobile apps are deemed as the "portable therapists in every pocket" (p. 21), providing psychological assistance digitally and thus, of potential significance, particularly for the younger generations and the geographically marginalised considering the fast growth of technological interventions and their use among those groups.

This thesis, therefore, focuses on analysing the dynamics between eco-anxiety management and mental health management mobile applications (mental mHealth¹ applications) and how they can be integrated by leveraging the AQAL Framework of Integral Theory (Wilber, 2005). The reasoning behind focusing on mHealth applications is the ease of access that comes with mobile healthcare and the growing demand for mHealth applications and digitalisation (Chandrashekar, 2018). The scope of this thesis is further narrowed down by exclusively collaborating with "Sensa" by Kilo Health, which is a mental mHealth application that focuses on managing issues like stress, anxiety, depression, etc., using Cognitive Behavioural Therapy (CBT) (Sensa.Health, 2023), to operationalise this research feasibly using a case study method.

1.1 Aim and Research Questions

The aim of this thesis is to thematically analyse current eco-anxiety management responses by employing the AQAL Framework of Integral Theory (Wilber, 2005) and to find the alignment between mobile mHealth applications and those eco-anxiety responses, using the case study of the mental health application "Sensa" (Sensa.Health, 2023).

This thesis has three guiding research questions (**RQ**), as follows:

RQ1. What psychological responses have been identified in the scientific literature to manage eco-anxiety, up to date?

¹ mHealth a term employed for "The use of mobile wireless technologies for public health" (WHO, 2018, p. 1)

RQ2. What mental health management features are included in the mobile mental health application Sensa?

RQ3. Drawing on the AQAL Framework of Integral Theory as an analytical framework, how do the scientific eco-anxiety management responses align with Sensa's mental health strategies?

1.2 Contribution to Sustainability Science

Eco-anxiety is an inter-and-transdisciplinary topic that lies in between (and beyond) Ecology, Sustainability Science and Psychology, often known as Ecopsychology (Roszak et al., 1995). Eco-anxiety connects the global issues of climate change and other environmental catastrophes to the local manifestations of human despair, worry and grief (Kates et al., 2001; Kurth & Pihkala, 2022). To effectively address the topics within Sustainability Science, it is necessary for research to consider the impact of critical processes across local and global scales, which is rigorously followed by this research by confronting the urgent and complex issue of eco-anxiety that impacts natural and societal systems (Kates et al., 2001).

Additionally, this thesis is one of its kind, since no previous scientific investigation is found on the integration of eco-anxiety and mental health applications as well as eco-anxiety and AQAL Framework of Integral Theory by Wilber (2005). There is past research done on the use of Integral Theory in psychology and Mental health (Duffy, 2020), but it has not been done in relation to mental health mobile applications. As such, this thesis may contribute to the sphere of problem-oriented research in Sustainability Science by integrating the subject matters mentioned above (Kates et al., 2001).

Eco-anxiety as a mental health issue is prevalent in people working in fields related to the environment and sustainability, which is counterproductive as these are the people who are actively dealing with operationalising climate action (Pihkala, 2017). Therefore, by focusing on eco-anxiety management, this thesis aids sustainability research on multiple scales.

Lastly, this research engages in critically analysing the AQAL Framework of the Integral Theory Model (Wilber, 2005), so that it could be better utilised for subjects in Sustainability Science (See Chapter 3.3).

1.2.1 Sustainability, Inner Transformation and Eco-anxiety

Inner transformation is also a recent add-on in Sustainability Science, emerging from the field of Ecopsychology (Roszak et al., 1995). Inner transformation and eco-anxiety are closely related and

can be explained using the narrative “story of separation”, which deems humans separate from nature and other beings itself, leading to technological dominance and human superiority over nature, and is being brought to our attention by the current ecological turbulence and mental health issues like eco-anxiety (Hendersson & Wamsler, 2020). This has given rise to the need to shift towards a new narrative, resulting in “Inner Transformation”, which leverages the inner dimensions of the human psyche to promote the interdependence and connection of all living things and ecosystems, urging for harmony and cooperation (Hendersson & Wamsler, 2020; Wamsler & Bristow, 2022).

It is in our primal behaviour to have the instincts to fight, flight, freeze, and fawn in a stressful situation (Taylor, 2022). When it comes to eco-anxiety, the instinct to “fight” may have a positive impact on our climate action or pro-environmental behaviour, but the others (flight, freeze and fawn) can hamper or stop people from taking proper steps to heal themselves as well as nature, leading to a vicious cycle of mind and environmental issues, similar to the one explained in the story of separation (Wamsler & Bristow, 2022). If eco-anxiety is not dealt with in a correct manner, it can cause issues in developing sustainable behaviours and systems, since it can give rise to maladaptive coping mechanisms which will only worsen the current situation (Pihkala, 2017). Therefore, this thesis facilitates management responses to eco-anxiety which are adaptive in nature and encourage pro-environmental behaviour through inner transformation.

2 Case Study Setting

2.1 Mental Health Management and Mobile Applications

Mental health mobile applications are becoming more common and prominent with the growing digitalisation (Chandrashekar, 2018). A World Health Organization (WHO) survey of over 15,000 mHealth applications found that 29% of all mHealth apps focus on mental health management (Anthes, 2016). This growth may be linked to mental mHealth applications' ease of access, affordable pricing, scalability and remote availability, yet the effectiveness of these applications to actually help people is usually debated upon (Chandrashekar, 2018). Chandrashekar (2018) also suggests that not only mental health mobile applications are helpful, but their utility can also be improved by having the properties of “high patient engagement, simple user interface and experience, transdiagnostic capabilities, self-monitoring features” (Chandrashekar, 2018, p. 2). At the same time, according to Neary & Schueller (2018), most available mental health applications lack scientific backing and do not include important psychological strategies like “assessment/self-monitoring, psychoeducation, progressive/applied relaxation, exposure, cognitive restructuring, stimulus control, and acceptance/mindfulness” (p. 3). Therefore, in order to base this thesis on a case study, it is important to take into consideration that the mobile mental health application that is used as a case adheres to the above-mentioned strategies to be reliable.

2.1.1 Why Sensa?

This thesis is drawing on “Sensa.Health” a.k.a Sensa, a mHealth application owned by “Kilo Health”, a company working on digital health solutions. I got in touch with Kilo Health through Lund University Careers Portal. Upon showing interest in collaborating with them for my master’s thesis, I was given the list of mHealth applications by Kilo Health so I could build a research proposal on the topic of interest. I selected Sensa seeing the scope of digitalising assistance for eco-anxiety management. Currently, there are no applications that target eco-anxiety management specifically (See Appendix 1), therefore, the most practical collaboration is with applications already working on mental health issues. Considering that Sensa seems to fit the criteria explained by both Chandrashekar (2018) and Neary & Schueller (2018) for mental mHealth applications likely to be reliable, I concluded that Sensa would be a favourable choice for this study. To know more about how Sensa features fit the criteria, see Chapter 2.2.1.

Lastly, Kilo Health's interest in this thesis topic (and the collaboration) is due to the company's focus on integrating eco-anxiety management with other mental-health management strategies.

2.2 Sensa mHealth Application

Sensa is a digital mental health mobile application developed by Mental Health Solutions UAB. The application was released in October 2021 and is available on iOS and Android, and is currently available in English, Spanish and Portuguese. There is no free version of the application, only paid (average price USD 22.5 per month), but the users can try the application and request a refund within 15 days in case they are not satisfied with it. The application has around 80,000 active users from more than 100 countries, with a current rating of 3.8/5 on the Google Store and a 3.7/5 rating on the App Store (Sensa.Health, 2023).

The application is currently being utilised for alleviating the symptoms related to anxiety, stress, procrastination, etc., primarily by employing Cognitive Behavioural Therapy (CBT), with the help of the expertise of Dainius Jakučionis (MD), a psychotherapist (Sensa.Health, 2023). The app is suitable for ages above 12 and is self-paced (Sensa.Health, 2023). Sensa is not a substitute for the treatment of mental health illnesses, but rather a personal guide to deal with moderate to mild situations of mental distress (Sensa.Health, 2023).

2.2.1 Sensa Features

A preface to the application's features can be found on their website ([See here](#)). The main features of Sensa are (Sensa.Health, 2023),

- a. *Self-paced lessons and tasks* (for understanding and structuring personal thoughts, emotions, and behaviour). These two features aid in high patient engagement, stimulus control and cognitive restructuring as explained by Chandrashekar (2018) and Neary & Schueller (2018).
- b. *Mood journal and weekly assessments* (for tracking mood to find patterns), linking to Chandrashekar (2018)'s capability criteria of self-monitoring and transdiagnostic capabilities.
- c. *Quick relief exercises* (mindfulness exercises for short-term relief), connecting to progressive/applied relaxation and acceptance/mindfulness strategies from Neary & Schueller (2018)

Screenshots of the application's interface can be found in Appendix 2. A detailed description of the different mental health management responses (MhMRs) by Sensa is in Chapter 5.3.

3 Conceptual Framing and Approaches

3.1 Eco-anxiety, EMRs and MhMRs

There is growing research on the mental health impacts of ecological catastrophes on humans (Coffey et al., 2021; Dodds, 2021; Léger-Goodes et al., 2022). In current literature, terms like “Climate Anxiety”, “Climate Change Anxiety”, “Eco-anxiety”, “Ecological Stress”, “Solastalgia” and “Climate Grief”, are used to denote the consequences of environmental stressors on mental health (Coffey et al., 2021). The terms aforementioned have similar, yet distinct meanings, even though they are fairly often employed interchangeably in existing (relevant) literature (Coffey et al., 2021). In this thesis, the term ‘eco-anxiety’ will be employed since it has an inclusive connotation and is not restricted to one environmental issue like climate change (Coffey et al., 2021). While there are multiple definitions of eco-anxiety, the American Psychology Association (APA) describes eco-anxiety as “A chronic fear of environmental doom” (2017, p. 68). The term “eco-anxiety” in itself suggests that the individual may be going through feelings of anxiety, but it is found that a set of different feelings and emotions are accompanied by it, such as, dread, helplessness, fear, tiredness, anger, despair, powerlessness, feelings of loss, feelings of phobia, etc. (Baudon & Jachens, 2021).

In the existing literature, there is no official term or definition for the psychological management responses to eco-anxiety. Researchers use terms such as, “eco-coping” (Ágoston, Csaba, et al., 2022), “treatment of eco-anxiety” (Baudon & Jachens, 2021), “reducing eco-anxiety” (Mishra & Gerencheal, 2022; Nice et al., 2023). Therefore, throughout this thesis,

1. I use the term “*Eco-anxiety Management Responses*” (EMRs) to describe the psychological strategies that aid in managing eco-anxiety, as eco-anxiety does not necessarily need to be “reduced” or “treated” in order to be mentally healthy (Dodds, 2021).
2. In addition, I use the term “*Mental Health Management Responses*” (MhMRs) to denote the psychological strategies used in Sensa that aid in managing mental health issues other than eco-anxiety.

The reason to define and use these terms is to contribute to the epistemological grounds of eco-anxiety and its management through this research, which is discussed in detail in the methodology section (Chapter 4).

3.2 Cognitive-Behavioural Therapy (CBT)

Cognitive Behavioural Therapy (CBT) is one of the most thoroughly researched forms of psychotherapy, providing a wide range of treatment strategies that are beneficial for a variety of

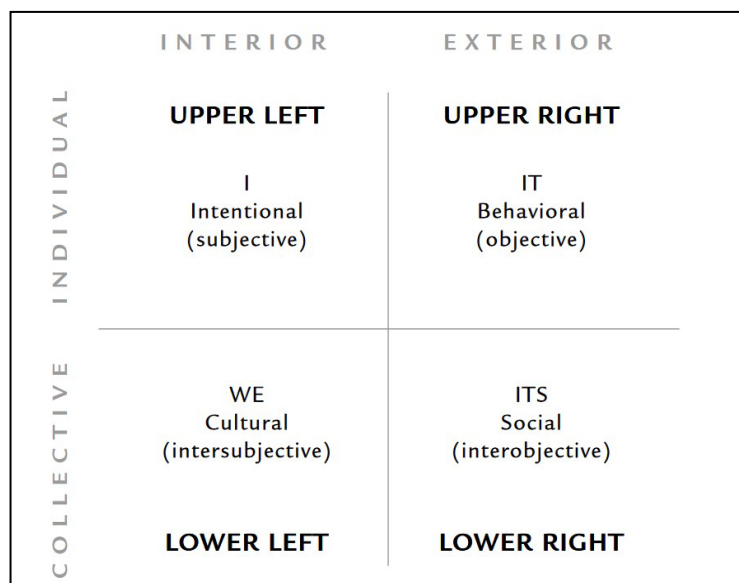
mental health issues, such as, anxiety disorders, depression, and post-traumatic stress disorder (PTSD), etc., by recognizing and then changing harmful thoughts and behaviour patterns that contribute to psychological suffering (Cuijpers et al., 2013; Hofmann et al., 2012). CBT is one of the main concepts in this thesis since the mHealth application Sensa employs CBT as its primary mental health management strategy, having three main components of thoughts, emotions and behaviour (Sensa.Health, 2023). Sensa uses different exercises and tasks that are based on CBT in order to manage the mental health issues of anxiety, depression, stress, burnout, etc. CBT has also been used in the context of eco-anxiety, and although only some research is focused on the impact of CBT on eco-anxiety, it has been found that CBT benefits people suffering from eco-anxiety and its related symptoms (Budziszewska & Jonsson, 2022).

3.3 AQAL Framework of Integral Theory

(Also referred to as the “Integral Framework” in this thesis)

3.3.1 Introduction

To explore the EMRs and MhMRs, this thesis will draw upon the AQAL Framework of Integral Theory



developed by Ken Wilber (2005). The Integral Framework is a newer model based on Wilber’s Integral Theory from 1977; a meta-theory built to integrate numerous standpoints through a single framework. The Integral Theory curbed the long-running, substantial need for an approach that could comprehensively study all the elements of any event in any domain (Esbjörn-Hargens, 2010a; Wilber, 2005).

Figure 1. The foundation of the AQAL model: The quadrants of Integral Theory. Extracted from Esbjörn-Hargens (2010a)

As explained in Chapter 1.2.1, there has been a constant separation of the self, collective and nature. This separation has also prickled down into the ways we respond to challenges. When it comes to mental health, current treatments are more focused on ‘outward’ and technological solutions like biological therapy (drug therapy, electroconvulsive therapy, etc.) which can have pronounced effects

(both positive and negative) on the human psyche (Duffy, 2020). Therefore, an integral perspective can be useful in psychology as it could weigh two or more different approaches, integrate them and/or get rid of some of them (Duffy, 2020), making the Integral Framework an ideal choice for this research.

According to Wilber (2005), there are 5 principal elements of all quadrants, all levels, all lines, all states, all types (p. 22) in the Integral Framework which create an Integral Map (or the model as we see in Figure 1), and these 5 elements can summarise the gist of any human concept, feeling or experience. The “types” are items which can be present in any quadrant, level, line or states. For example, types of emotions, types of genders, etc. The “lines”, however, belong in different states and levels, and are the lines of progress, explaining how good, or bad is someone at one phenomenon or other. The states are the current state of consciousness one is present in – like waking, sleeping, dreaming, etc., while levels, also known as stages, are the levels of growth – explaining which stage of development one is at. For example, human levels of growth are from infancy to adulthood. The quadrants are the areas where all of the growth and development is happening in different states, lines, types and levels.

The AQAL framework of Integral theory comprises four quadrants (See Figure 1) integrating the I, It, We, Its, or the Intentional, Behavioural, Cultural and Social spheres of reality, respectively (Esbjörn-Hargens, 2010b; Wilber, 2005). The interior is also called the subjective or feeling - relating to the subjectivity of the individual to the culture or collective, on the other hand, the exterior depicts the objectivity or the physiological aspects of the individuals and the systems of the collective (Wamsler et al., 2022). This study extensively discusses upon the four spheres of reality of the Integral Model, but refrains discussion on the levels, states, lines and types due to the thesis’s scope.

The Integral Framework works as a lens through which this thesis gazes upon the EMRs and MhMRs, providing a unique and helpful perspective (Grant & Osanloo, 2014). A theoretical framework is considered the foundation, a “blueprint” of research, and helps build, guide, structure and support the thesis (Grant & Osanloo, 2014). Every house has a different blueprint, similarly, every research requires a different framework and different approaches to the framework (Grant & Osanloo, 2014). Therefore, the modifications in and application of the Integral Framework in the case of this thesis are explained in detail in the following section.

3.3.2 Application of the Framework

The Integral Framework has been applied in the sustainability context before by many different authors (Examples: B. C. Brown, 2005; Esbjörn-Hargens, 2010a; Esbjörn-Hargens & Zimmerman, 2009; Ives et al., 2020; O'Brien & Hochachka, 2011; Wamsler et al., 2022; Wamsler & Bristow, 2022, etc.), but it has never been employed in the context of eco-anxiety and its management before this thesis. Although Esbjörn-Hargens (2010a), Wamsler & Bristow (2022) and Ives et al. (2020) discuss along the lines of eco-anxiety and inner transformation, eco-anxiety and its management is only a sub-component from the prime areas of their research. Because the Integral Framework has not been extensively used for eco-anxiety management before, two modifications have been made in the framework for this thesis, to accommodate eco-anxiety management responses and have a clearer understanding of them.

Sustainability Science and its related subject matters are widely inter-and-transdisciplinary and often influence and impact one another (Jerneck et al., 2011), therefore, the mental health management responses found in this research could also have such potential interactions and overlaps, which would be difficult to explain using the distinct and separate depiction of the quadrants in the existing Integral Framework model (See Figure 1). Therefore, the two modifications (Figure 2 below) made in the depiction of the Integral Framework model are as follows.

- a) Instead of depicting the four dimensions of the Integral Framework as four linear quadrants, I have depicted them as four circles or spheres for EMRs & MhMRs (See Figure 2).
- b) Instead of having four separate quadrants, the four spheres intersect with each other, hence, also intersecting all together in the middle (Similar to a Venn diagram), explaining the consequential interactions between the four dimensions of EMRs & MhMRs (See Figure 2).

This change in the depiction of the Integral Framework does not contradict the meaning or intention of the framework, and neither does it disturb the harmony between the four dimensions. Rather, it helps in accommodating the transdisciplinarity of EMRs that would be otherwise impossible to depict and so, lost in the previous Integral Framework diagram (Figures 1 & 2). Additionally, to address the new parts of the model formed because of the intersecting spheres, I name the EMRs & MhMRs that interact between two spheres as the “Interlapping responses” (See Figure 2) and the ones that interact with all the spheres as the “Integral Responses” (See Figure 2).

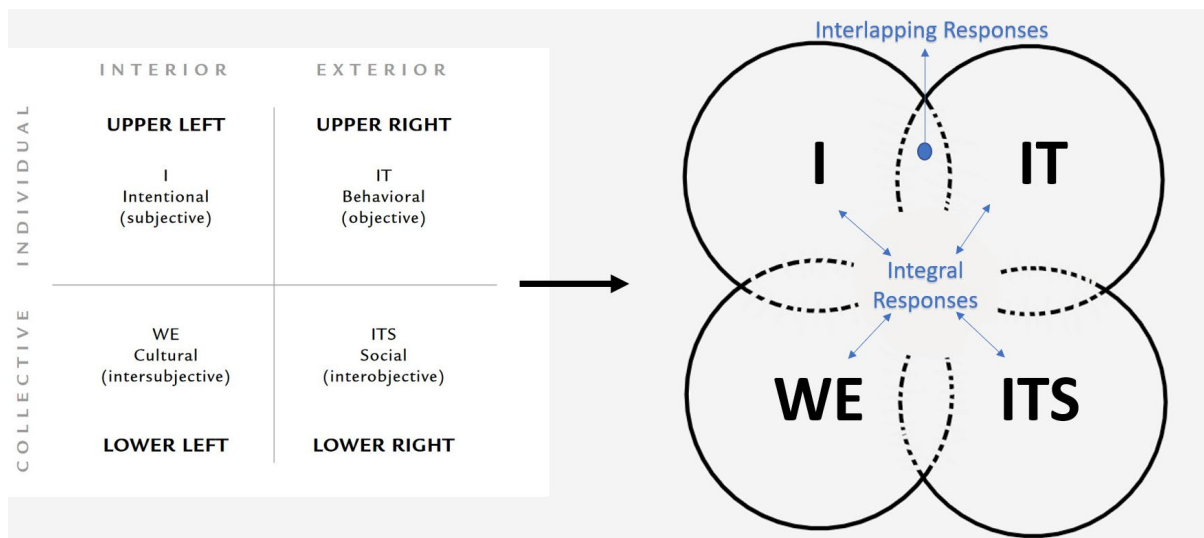


Figure 2. The Integral model (Wilber, 2005), modified from four separate quadrants to four intersecting spheres. Figure on the left by Esbjörn-Hargens (2010a), figure on the right created by the author.

4 Methodology

This chapter includes the epistemological considerations of the research, the research design, data collection, analysis, the scope and limitations of the chosen research methodology as well as design and lastly, the positionality of the author.

Epistemological Considerations

Sustainability Science, being explicitly transdisciplinary (Kates et al., 2001), gains an advantage by utilising critical realism as its “underlabourer” (Høyer & Naess, 2008). Since this interdisciplinary study falls under Sustainability Science, interpreting the epistemological grounds (meta-analysis) of EMRs through critical realism helps contribute to the meta-theory of eco-psychology (Isaksen, 2012). A critical realist’s perspective is also well positioned when it comes to the theoretical choice of this thesis, as both Integral Theory (Wilber, 2005) and critical realism are viewed as arbitrators for resolving complex interdisciplinary issues (Bhaskar et al., 2015).

4.1 Research Design

As a critical realist, the chosen method is important but not more than the appeal behind choosing the method (Easton, 2010). This research is multifaceted as it aims to contribute to the meta-theory of EMRs, whilst discovering its stance with mental mHealth applications. An iterative, non-linear process was carried out to connect the research questions and aim to the data collection, providing the flexibility that is desirable in a case study (Easton, 2010). In doing so, the optimal route to the targeted queries is found by qualitatively analysing different EMRs obtained from a Systematic Literature Review (SLR) and finding if these EMRs align with the mobile application Sensa. The research design takes guidance from the three research questions and shapes the methodology accordingly. RQ1 & 2 (Figure 3, see below) guide the data collection while RQ3 helps with the data analysis and display. The data is thematically analysed using the AQAL Framework of Integral Theory (Wilber, 2005). The modified model of Integrated theory, its four spheres and the interactions between those spheres are used to segregate Data A & B's responses into different diagrams and charts to make sense of the data. Upon completion of these steps and analyses, results are illustrated.

Case Study Design

The research follows a case study design. Sensa's qualitative data is studied in a bounded system to comprehend the stance of EMRs in mHealth applications practically and accessibly (P. A. Brown, 2008). According to P. A. Brown (2008), a case study-based approach is ideal for this kind of qualitative research and procedural epistemology, since it has a heuristic nature that allows a small unit to be the base for observing and interpreting a bigger phenomenon. A case-study-based research design can have both advantages (interpreting through critical realism) and disadvantages (negative bias of the researcher, can be subjective and generalised) (P. A. Brown, 2008). Strong reasoning behind choosing the study, clear documentation of the research methodology and using an illustrative framework for analysing the case study are ways to reduce the disadvantages and weaknesses of case-based research, and these steps are followed religiously to reduce the bias and disadvantages of the case study used in this thesis (Yin, 2009).

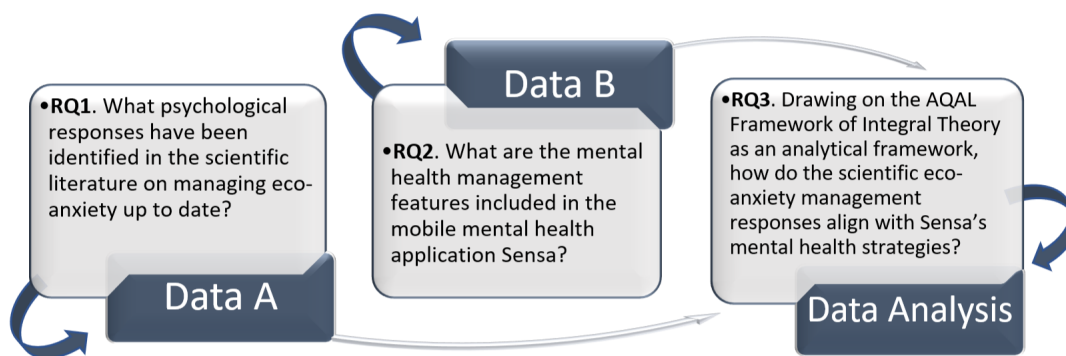


Figure 3. Linking the study research questions to specific data

4.2 Data Collection Methods

4.2.1 Systematic Literature Review (SLR) for Eco-anxiety Management Responses

To collect the first part of the primary data or Data A (See Figure 3) for RQ1 (finding EMRs), a Systematic Literature Review (SLR) is conducted to find peer-reviewed research articles on the topic. In this section, I will elaborate on the purpose, reasoning and outcome of the first part of the data collection and its method. To find EMRs, it is important to go through the current scientific knowledge available on ways eco-anxiety can be managed, which can only be obtained by performing a SLR. Understanding the phenomenon and concept of eco-anxiety and its management strategies necessarily requires a SLR, as it is crucial in academic studies to systematically instigate new knowledge upon extant information and studies (Bryman, 2012; Xiao & Watson, 2019). SLR is also the optimal data collection method for this thesis as it requires scientific, unbiased (or the least

biased) and authenticated literature on EMRs, which will be difficult to avail from other methods of data collection, such as, surveys, observation, interviews or focus groups, etc. (Fisch & Block, 2018; P. A. Brown, 2008; Bryman, 2012). The SLR protocol was adapted from a guide to conduct a SLR by NIDILRR (2023).

Collecting data for a multi-disciplinary topic like eco-anxiety is a challenging task since the data can be found in many places (Papaioannou et al., 2009), therefore, to find as much data as feasible, the data was found through multiple databases namely, Scopus, EBSCOhost, MDPI and NCBI (n=4). As per Bryman (2012), peer-reviewed articles are very reliable in academic research and should be prioritised in a SLR. Therefore, only peer-reviewed research articles were extracted in this literature review. Search terms “eco-anxiety management strategies” “eco-anxiety management responses”, “eco-anxiety responses”, “eco-anxiety management”, “coping with eco-anxiety” and “deal with eco-anxiety” were used to find data on eco-anxiety management responses. See the description in Table 1 below.

Table 1. Systematic Literature Review (SLR) Overview

Sr. No.	Search Term used	Number of articles found on				Articles omitted	Articles Selected
		<i>Scopus</i>	<i>EBSCOHost</i>	<i>MDPI</i>	<i>NCBI</i>	<i>Repetition/relevance</i>	
1	“eco-anxiety and management and strategies”	2	3	1	26	30	2
2	“eco-anxiety and management and responses”	6	9	0	31	45	1
3	“eco-anxiety and responses”	42	40	4	55	139	2
4	“eco-anxiety and management”	9	23	2	38	65	7
5	“coping with eco-anxiety”	19	25	4	31	66	13
6	“deal with eco-anxiety”	5	7	2	15	27	2
	Total:	83	107	13	196	372	27

A total of 399 articles were analysed through the literature review. The following three were the selection criteria for the data collected from SLR:

1. Only peer-reviewed articles written in English was be selected since I have limited skills in other languages.

2. Focus on “eco-anxiety” and its management responses, not on other (similar) terms like climate change anxiety, solastalgia, etc., as the central component of the articles.
3. Exclusion of literature linked to “Eco-grief” and/or articles constituting the positive sides (e.g., climate action) of eco-anxiety.

From the 27 articles identified upon the primary investigation, three more articles were omitted after reading the full research articles, leaving a total of 24 articles (**n=24**). The reasons for omitting the three articles were,

1. The article by Mishra & Gerencheal (2022) was not for a psychological response to eco-anxiety, but a way of managing eco-anxiety by inculcating renewable energy behaviour e.g., buying electric cars. Note that it can be linked to “green” self-identity as a coping mechanism (Verplanken et al., 2020), but no such linkages were found in the paper.
2. Boluda-Verdú et al. (2022) explained in detail how eco-anxiety is connected to other mental illnesses but didn’t focus on the management part of eco-anxiety.
3. Diffey et al., (2022) extensively talked about eco-emotions but didn’t have any EMRs.

The data collection process is displayed using a flow chart diagram (Figure 4, see below), inspired by the PRISMA method (Page et al., 2021), which is a method exclusively used in systematic literature reviews. This is done to make sure that the readers of this thesis can get a transparent and accurate process of how the systematic literature review was conducted (Page et al., 2021).

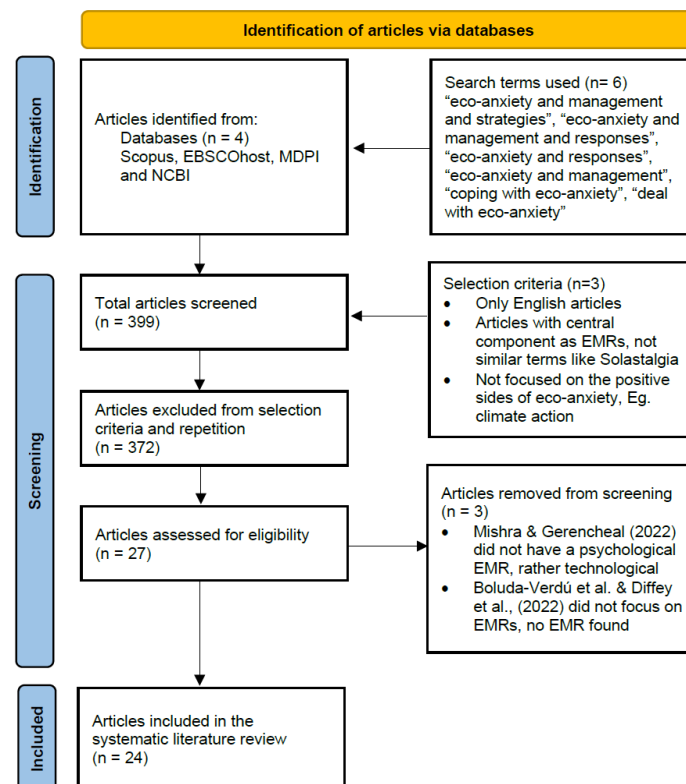


Figure 4. PRISMA display of data collection. Source: Author’s own illustration based on Page et al. (2021)

I used Zotero for securing all the data and for creating a list of literature with important information about the articles. Zotero is open-source and free reference management software, and I have used it throughout this thesis for the purpose of referencing and data management. Since the concept of eco-anxiety is still new and is also an emerging topic (American Psychological Association & ecoAmerica, 2017; Coffey et al., 2021; Kurth & Pihkala, 2022), the data collected was not too broad in scope, and additionally, recent and quality research was easily found using different databases mentioned above, reducing the limitations and disadvantages (See 4.4.2) of the research design. The articles (n=24) range from 2023 being the most recently published articles to 2017 being the earliest. All are journal articles except for two, one being a conference paper and the other being a section from a book. All articles are peer-reviewed, academic and come from reliable sources.

4.2.2 Mental Health Management Responses (MhMRs) From Sensa

After constituting EMRs, to collect the second part of the data or Data B (See Figure 3) for RQ2 (finding Sensa's mental health management responses), I examine the content available on Sensa's mobile application and its website to find MhMRs. A total of 63 MhMRs are found and are the primary data for the data analysis. A detailed description of the MhMRs can be found in Findings and Discussions (Chapter 5.3).

4.3 Data Analysis

4.3.1 Data Analysis of SLR (RQ1) and MhMRs from Sensa (RQ2)

I performed a content analysis on the 24 selected peer-reviewed research articles and the MhMRs found in the mobile application Sensa. Content analysis involves a systematic and objective approach to identify particular features of messages, allowing researchers to draw inferences based on their observations (Holsti, 1969). I further incorporated the deductive data analysis method, where I have six overarching themes, based on the modified model of the AQAL Framework of Integral Theory (Wilber, 2005). The themes are, Individual Interior (I), Individual Exterior (IT), Collective Interior (WE), Collective Exterior (ITS), Interlapping Responses (I + IT, IT + ITS, etc.) and Integral Responses (I + IT + WE + ITS). This type of deductive analysis method is often employed by researchers who are employing an established theoretical framework that they want to apply to their data, beginning with a set of predetermined codes or categories derived from the theoretical framework, which are then systematically applied to the data (Miles et al., 2019). Note that I defined two from the six themes already in the previous chapter, the "Interlapping responses" and "Integral responses", which are essentially the EMRs and MhMRs that impact either, any two of the four

spheres or, all of the four spheres of the Integral Framework (Wilber, 2005). The content analysis and its coding were performed using Nvivo 12, which is a software tool designed for qualitative data analysis, offering a range of functions that support researchers in managing and analysing large sets of unstructured data, including audio, video, and text files (Nvivo, 2020). The reason behind choosing the software was that the software is available for free for Lund University Students.

4.3.2 Collective Analysis (RQ3)

To collectively analyse the data i.e., find the alignment between EMRs and Sensa MhMRs, I compare the MhMRs and EMRs by understanding the psychological strategies that lie behind the MhMRs and how much similarity or aversion they show towards the identified EMRs. I name and explain them as follows,

1. Highly Complementing (When the MhMR is very similar to the corresponding EMRs)
2. Somewhat Complementing (When the MhMR is a bit similar to the corresponding EMRs)
3. Somewhat Discounting (When the MhMR has some aversion to the EMRs)
4. Highly Discounting (When the MhMR is completely averted to the EMRs)
5. No corresponding EMRs (When the MhMR does not have any corresponding EMRs)

I assemble the data into a table of the MhMRs and colour-code them according to the distinctions mentioned above. The colour code and table are both found in the results and discussion section (Chapter 5.3). It is important to note that the EMRs that do not have any similar MhMRs in Sensa, may also discount the usability of the application for eco-anxiety management. Therefore, I also discuss this relationship in the next chapter.

4.4 Scope and Limitations of the Research Design

4.4.1 Scope (Research Design)

The research is bounded to eco-anxiety management responses - similar terms are not prioritised in the thesis as eco-anxiety is considered the overarching term that encompasses all kinds of ecological distresses (Kurth & Pihkala, 2022), and the EMRs are based on English, peer-reviewed, academic and online articles focusing on managing eco-anxiety, using only 6 search terms and 4 databases. At the same time, the design is bound to the synergies and trade-offs between EMRs and the mental-health application Sensa.

4.4.2 Limitations (Research Design)

The data is limited to EMRs in peer-reviewed research articles limiting the thesis and its applications to the existing research ontologically. As more progress will be made in the field, this study will

become less relevant due to its dependence on current knowledge (Papaioannou et al., 2009). The data analysis is based on the author's expertise, creating individual bias, which might lead to limited objectivity and impartiality in the study. However, a strict methodology and logical justifications were employed throughout the thesis to reduce such biases. The MhMR data is from only one mental health application, Sensa, as this is a case study, limiting the utility of EMRs in the wider use of mHealth applications to only generalised results (P. A. Brown, 2008). Additionally, a drawback of using deductive qualitative analysis is that it relies on predetermined codes or categories that may not encompass all the relevant aspects of the data, potentially resulting in a limited and incomplete understanding of the data's complexity and richness (Miles et al., 2019), the measure of modifying the Integral Framework model was taken to curb this limitation. Other than this, the phenomenon known as publication bias may lead to an overestimation of the effectiveness or significance of certain interventions or findings, as well as a lack of representation of negative or null results through a SLR or meta-analysis, as embarked on in this thesis (Sterne & Egger, 2001).

4.5 Positionality

Here, I describe my social and cultural outlook that may impact my research through my perspectives, values, and assumptions (L. T. Smith, 2013). I am an Indian, brown, female student at Lund University, Sweden. I am not religious but consider myself spiritual. All my knowledge on eco-anxiety is based on what I have learned at Lund University and through this research. It is common for people in the field of environment and sustainability to be struggling with eco-anxiety (Pihkala, 2017). Be that as it may, I also think that I am dealing with eco-anxiety at times.

At last, I am aware that I have a personal interest in Kilo Health, which also extends towards the application Sensa since I consider Kilo Health as one of my career-related prospects. However, I must clarify that this does not impact the quality and fairness of this research since showing ethical, apt and critical research skills would be in my favour. I received no funding or salary for this thesis but I was provided with free access to the Sensa mobile application (which is paid-only) for research purposes of this thesis.

5 Findings and Discussion

Chapter 5 includes the thesis's findings and discussion. First, the results from the Systematic Literature Review (SLR) are discussed in the section 5.1. After that, the findings subsequent to the application of the updated model of AQAL Framework of Integral Theory (Wilber, 2005) to the EMRs and MhMRs are discussed in the section 5.2. Lastly, the results on the analysis of the alignment between the MhMRs from Sensa and EMRs from the SLR are discussed in the section 5.3. The limitations of the thesis and my personal reflections are also discussed in the sections 5.4 & 5.5.

5.1 Systematic Literature Review (SLR)

By conducting a systematic literature review (SLR), 24 peer-reviewed research articles have been identified to fit the selection criteria, from which current EMRs are extracted by performing a content analysis. A detailed description of the literature and their resulting EMRs can be seen in Table 2.

The SLR extracted literature from 2017 to 2023 (without having any limit on the publication date in the search strategy) resonating with what has been found by Coffey et al (2021), where the earliest article that specifically used the term "eco-anxiety" and aided in operationalising eco-anxiety, found through a systematic review by the researchers, was from 2018 by Pihkala. The earliest article found in this thesis's SLR is from the year 2017 also by Pihkala.

The eco-anxiety management research found through the SLR grew rapidly over the years (See Table 2), with the year 2022 having the most research articles - with 14 articles out of the total 24 articles included in the SLR, followed by three articles from years 2023 as well as 2021, however, it is to be taken in consideration that the SLR was conducted in March 2023, indicating that more articles in relation to EMRs may be expected this year. Two articles are from the year 2019, and lastly, only one article each is from the years 2020, 2018 and 2017. The reduction in articles found on EMRs from 2019 (two articles) to 2020 (one article) could possibly be linked to the pandemic and resulting lockdowns during 2020.

The reviewed literature describes eco-anxiety as a "wicked problem" (Usher et al., 2019). These kinds of problems are challenging to solve because their responses rely on numerous interconnected factors and attempting to solve such a problem may lead to other complex problems (Jerneck et al.,

2011), strengthening the need to look at such issues from a holistic perspective, therefore, further accommodating the framework and the theory of choice for this thesis.

The problem of eco-anxiety is also described as a mortality crisis or being unable to overcome the concept of death (Guthrie, 2023; Pihkala, 2017), hence, urging over the importance of acceptance (Guthrie, 2023), mortality salience, spirituality and “observing a tragic drama is a kind of vaccination” (Pihkala, 2017, p.118).

Although all the articles scrutinise EMRs, only three articles (Ágoston, Csaba, et al., 2022; Baudon & Jachens, 2021; Pihkala, 2022b) are primarily focused on the analysis of multiple EMRs and their interplay. The literature analysed in this research shows the evolution of eco-anxiety as a concept and how we deal with it. The reviewed literature also goes into the re-wording of EMRs, rephrasing generic psychological terms like “Hope”, “Resilience”, “Coping”, etc. into terms having a specific eco-anxiety context, such as, “Constructive Hope” (Léger-Goodes et al., 2022) or “Realistic Hope” (Pihkala, 2017), explaining the need to have hopes and expectations that are based on self-acquired knowledge about the reality of the situation, so as to save oneself from losing the sight of the truth, “Transformative Resilience” (Pihkala, 2022b) in the context of post-trauma, where not only one bounces back from the trauma but also finds ways to grow around it and “Coping Flexibility” (Pihkala, 2022b) ability to access multiple coping mechanisms at the same time or separately depending on the circumstances one is dealing with. This kind of re-wording and tweaking helps in integrating research in order to fit it into the epistemology of eco-anxiety and its management responses (Bailey et al., 2020).

While many research articles and authors are retained through this SLR, the articles from the Finnish researcher Panu Pihkala are cited, multiple times, in most of the articles found in the SLR. Pihkala is also considered as one of the leading experts in eco-anxiety (ResearchGate, 2022).

The SLR found no articles from the countries in the global south (Table 2). Only one article, by Lutz et al (2023), partly included some global south context as it was based on three countries - Canada, China and UK. All the other articles are from the authors as well as participants from the global north, showing a great lack in the perspectives and voices from the global south on how eco-anxiety can be managed. This lack of knowledge from the global south on EMRs is problematic because the mental health issues in these countries are far more challenging to tackle due to their intersectionality as well as complexity, only exaggerated by the stigma around mental health issues in those countries (Pendse et al., 2019; Porter et al., 2021). This shows a potential research gap in the EMRs.

Table 2 Content: In the table, the articles are arranged alphabetically by their citations/authors. The table includes the title of the article, publication date, countries, research method and lastly the EMRs identified. Note that in the country section, the first half are the countries the authors belong in, the half after the semicolon “;” are the countries on which their data is based and if no such distinction is made then the author and the data are based in the same country.

Table 2. EMRs identified in the 24 final articles from the SLR (Table created by the author)

Sr. No.	Citation	Title	Countries (Author; Data)	Method	Distinct EMRs Identified
1	Ágoston, Csaba, et al., 2022	Identifying Types of Eco-Anxiety, Eco-Guilt, Eco-Grief, and Eco-Coping in a Climate-Sensitive Population: A Qualitative Study	Hungary	Semi-structured interviews (n=17) Males = 6, Females = 11, ages 19 to 77	Emotion-focused coping: Positive reappraisal, optimism, Withdrawal/acceptance, Problem avoidance/denial/ wishful thinking; Problem Focused Coping: Confrontation, Taking Action; Social Support Groups/community building, e.g., Extinction Rebellion;
2	Ágoston, Urbán, et al., 2022	The psychological consequences of the ecological crisis: Three new questionnaires to assess eco-anxiety, eco-guilt, and ecological grief	Hungary	Semi-structured interviews (n=17) Males = 6, Females = 11, ages 19 to 77	Meaning & problem-focused coping: Individual and Collective mitigation actions, focusing on prosocial outcomes, adaptive coping mechanism
3	Baudon & Jachens, 2021	A Scoping Review of Interventions for the Treatment of Eco-Anxiety	Switzerland; Various (not mentioned)	Scoping Literature Review (n=34); Arksey and O'Malley's five-stage methodological framework	Self-Care Interventions; Interventions Connecting Clients with Their Lyrical Self; Psychotherapy: psychodynamic therapy, psychoanalysis, Jungian depth psychology, Counselling, narrative therapy, Motivational Interviewing; CBT: Mindfulness-Based Cognitive Behavioural Therapy, Conservation psychology; Eco-therapy
4	Budziszewska & Jonsson, 2022	Talking About Climate Change and Eco-Anxiety in Psychotherapy: A Qualitative Analysis of Patients' Experiences	Poland; Sweden	Qualitative Interviews (n=10), Males = 5, Females = 5, ages = 18 to 49, interpretative phenomenological analysis (IPA),	personal values and action orientation; CBT; Emotion Focused coping: Validation of eco-emotions, eco-emotion management; Integrative Psychotherapy (humanistic and existential focus); short-term psychodynamic therapy; Finding a "Competent Companion While Facing the Climate Reality"
5	Eriksson et al., 2022	Addressing Students' Eco-anxiety when Teaching Sustainability in Higher Education	Sweden	Project-based result, weekly project meetings from October to December 2021	Maintaining balance, remembering joy, upholding meaningfulness, Storytelling
6	Gallay et al., 2022	Place-based civic science—collective environmental action and solidarity for eco-resilience	USA	Qualitative Analysis from responses (n=486) (majority of colour) of students (6th to 12th Grades) who are participants of the Place-Based Civic Science projects	Developing civic skills; creating non-hierarchical intergenerational partnerships
7	Gislason et al.,	The Interplay between Social and	OECD countries (Canada,	Rapid review & thematic	'Head, heart and feet/hand engagement'; community action; CBT: Identify

	2021	Ecological Determinants of Mental Health for Children and Youth in the Climate Crisis	Australia, USA, UK, Netherlands, Sweden, Portugal, and Finland)	analysis of literature (n=58)	troubling situations, become aware of thoughts, emotions and beliefs, identify negative or inaccurate thinking, negative behaviour, Reshape negative or inaccurate thinking, Integrated Knowledge to Action (iKTA),
8	Gunasiri et al., 2022	Hope, Coping and Eco-Anxiety: Young People's Mental Health in a Climate-Impacted Australia	Australia	mixed-method approach; semi-structured interviews (n=14), ages = 18 to 24; online survey (n=46)	Participation in climate action, connection to nature; lifestyle change; become informed.
9	Guthrie, 2023	How I Learned to Stop Worrying and Love the Eco-Apocalypse: An Existential Approach to Accepting Eco-Anxiety	USA	examined eco-anxiety from a new perspective by combining multiple theoretical frameworks.	cognitive acceptance, affective acceptance and Death acceptance; terror management, Acceptance-Commitment Therapy (ACT)
10	Léger-Goodes et al., 2022	Eco-anxiety in children: A scoping review of the mental health impacts of the awareness of climate change	United States, Sweden, England, Finland, Australia, Canada, Taiwan, Mixed	Scoping Review of Literature on eco-anxiety, climate change and children (below 18); descriptive-analytical method; n = 18	constructive hope, positive coping mechanism; meaning-focused coping
11	Lomas, 2019	The Elements of Eco-Connection: A Cross-Cultural Lexical Enquiry	UK, Various	lexicography, 'quasi-systematic' review, analysis of words using grounded theory (GT)	eco-connection; sacrality, bonding, and appreciation
12	Lutz et al., 2023	The Continuum of Eco-Anxiety Responses: A Preliminary Investigation of Its Nomological Network	Canada, China, UK	5 studies (n=2939), survey, students	pro-environmental orientation and behaviour: collective eco-guilt, empathy with nature, nature connectedness
13	Nice et al., 2022	School Counselor and Environmental Educator Partnerships: Reducing Eco-Anxiety From Climate Change, Increasing Self-Efficacy, and Enhancing Youth Advocacy	USA	review of literature with a focus on ASCA National Model Framework	Addressing eco-anxiety; classroom or small group interventions; local role models to encourage students for their own actions and solutions; community stories
14	Ojala et al., 2021	Anxiety, Worry, and Grief in a Time of Environmental and Climate Crisis: A Narrative Review	Sweden, UK, Canada; various	Narrative review	meaning-focused coping: Trust in Societal actors and switching perspective; collective engagement; community resilience
15	Pihkala, 2017	Environmental education after sustainability: hope in the midst of tragedy	Finland; not mentioned	Interdisciplinary approach to eco-psychology and Environmental Education	peer group work; Realistic hope; focuses on coming to the grips of mortality for building psychological capital; self-reflection; observing mortality drama
16	Pihkala, 2022a	Commentary: Three tasks for eco-anxiety research – a commentary on Thompson et al. (2021)	Finland; Various countries	commentary, based on the author's expertise	focusing on global-local linkage; building efficacy; emotional literacy, engaging with emotions.

17	Pihkala, 2022b	The Process of Eco-Anxiety and Ecological Grief: A Narrative Review and a New Proposal	Finland; Not mentioned	interdisciplinary environmental research, narrative review of relevant literature	Psychological adaptation for practical eco-anxiety; Dialectical Behavioural Therapy (DBT); DPM: Restoration-oriented and Loss-Oriented; Denial, Anger, Bargaining, Depression, and Acceptance (DABDA) model; Power-Threat-Meaning Framework; Acceptance-Commitment Therapy; "transformative resilience"; "Coping flexibility"; Action, Grieving, and Distancing; constructive coping; post-traumatic growth
18	Skilling et al., 2022	Navigating hope and despair in sustainability education: A reflexive roadmap for being with eco-anxiety in the classroom	New Zealand	Reflection paper of teaching sustainability	Head, heart and hands in sustainability education; realistic hope
19	Soutar & Wand, 2022	Understanding the Spectrum of Anxiety Responses to Climate Change: A Systematic Review of the Qualitative Literature	Australia; Various	Systematic Literature review (n=15)	problem-focused coping in adolescents
20	Usher et al., 2019	Eco-anxiety: How thinking about climate change-related environmental decline is affecting our mental health	Australia; Various	Not mentioned, narrative	eco-anxiety communication; build community resilience by sharing impartial knowledge on climate change
21	Verplanken et al., 2020	On the nature of eco-anxiety: How constructive or unconstructive is habitual worry about global warming?	European countries (inc. UK); USA	3 studies and their reflections	"green" self-identity for cognitive & affective coping
22	Walshe et al., 2022	Eco-Capabilities as a Pathway to Wellbeing and Sustainability	UK; various	Eco-capabilities built on Amartya Sen's Human Capabilities & children participating in arts in nature practice (n=101)	Capabilities and Relationships with/of Nature; The Arts as a Mechanism for Developing Capabilities and Wellbeing; Autonomy; Bodily Integrity and Safety; Relationality: Human; Mental and Emotional Wellbeing; Relationality: Nonhuman; Senses and Imagination; Spirituality
23	Wang et al., 2023	Coping with eco-anxiety: An interdisciplinary perspective for collective learning and strategic communication	Canada, USA; various	eco-anxiety primer based on recent scoping reviews and seminal empirical research	Storytelling for Social and behaviour change; Positive deviance for complex problem-solving
24	Westoby et al., 2022	Turning to Nature to Process the Emotional Toll of Nature's Destruction	Australia; Various	Theme analysis of participant responses (n=72) to questionnaire, ages = 18 to 78; males 28.6%, females = 71.4%	Connecting with, and being in, nature

5.2 Integral Findings & Discussion on EMRs & MhMRs

This section combines the findings and discussion on the content analysis of the SLR and the mental health features from the mobile app Sensa as seen through the analytical lens of the AQAL Framework of Integral Theory (Wilber, 2005). Figure 5 (See below) depicts the Integral Framework applied to the EMRs and Figure 6 depicts the Integral Framework applied to the MhMRs. While all the MhMRs are from the Sensa application itself, to understand how different EMRs from the Figure 5 are relating to different researches, refer back to the Table 2 above. The sub-sections in this section are divided according to the spheres and their interactions in the modified Integral Framework model and they elaborate on the figures 5 & 6 step-by-step. These sub-sections are, the Individual Interior (Chapter 5.2.1), Individual Exterior (Chapter 5.2.1), the Collective Interior and Exterior (Chapter 5.2.3) and lastly the Interlapping and Integral Responses (Chapter 5.2.4).

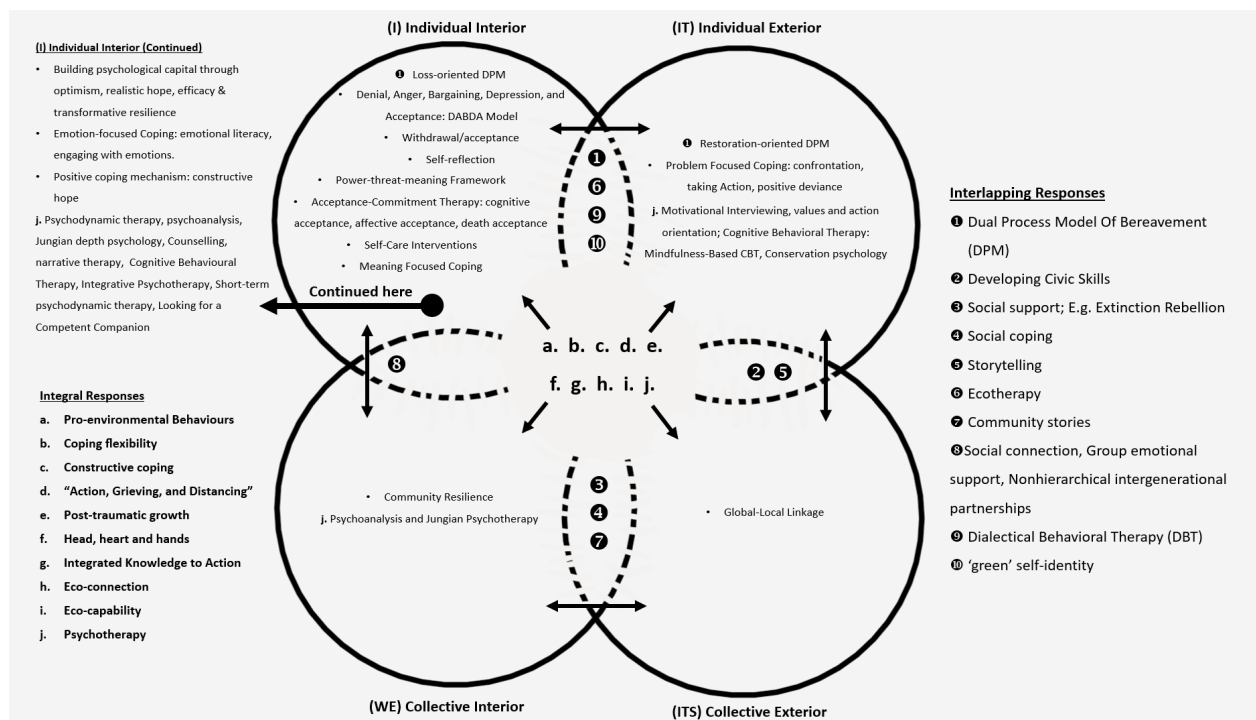
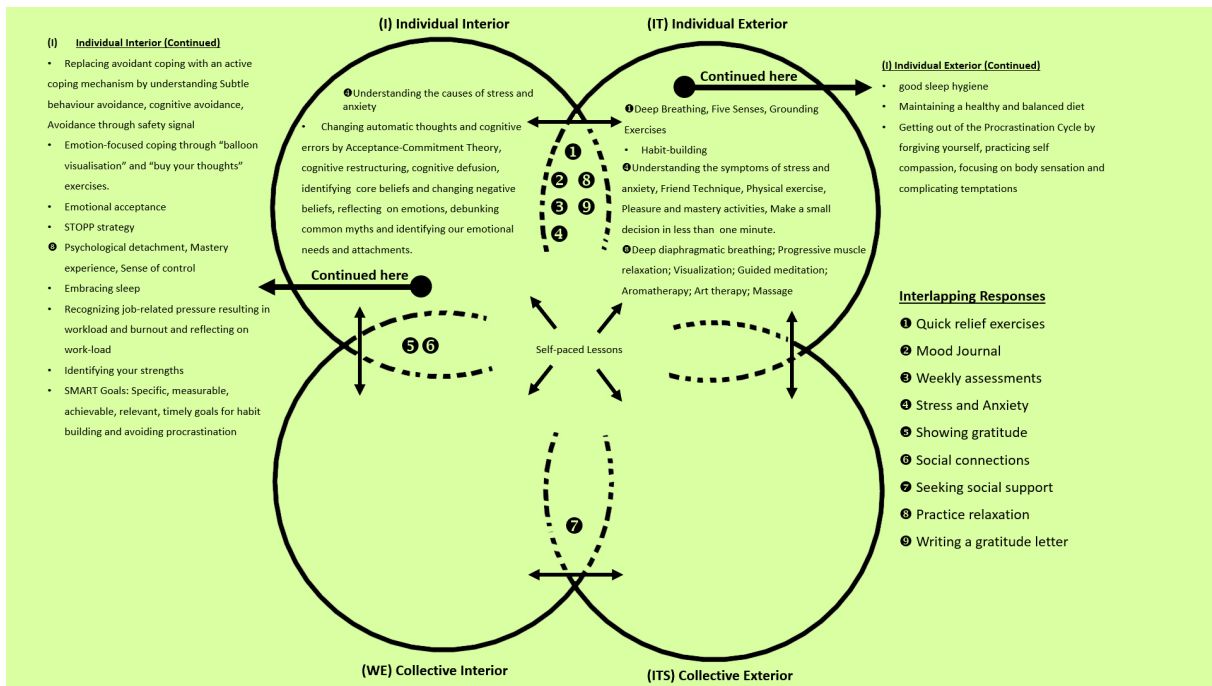


Figure 5. Application of the Integral Framework to EMRs (Created by the author)

Figure 5 Content: The figure has six main elements - Individual Interior (The upper left sphere), Individual Exterior (The upper right sphere), Collective Interior (The lower left sphere), Collective Exterior (The lower right sphere), Interlapping Responses (The responses in the intersection of any two spheres, represented using number symbols like "1") and Integral Responses (The responses in the middle of all the spheres collectively, represented using lower-case alphabets followed by a dot, like "a.").



**Figure 6. Mental Health Management Responses (MhMRs) From Sensa using the Integral Framework
(Created by the author)**

Figure 6 Content: The figure has six main elements - Individual Interior (The upper left sphere), Individual Exterior (The upper right sphere), Collective Interior (The lower left sphere), Collective Exterior (The lower right sphere), Interlapping Responses (The responses in the intersection of spheres, represented using number symbols like “1”) and Integral Responses (The response in the middle of all the spheres).

5.2.1 Individual Interior (I)

The Individual Interior or “I”, is the Intentional sphere (Esbjörn-Hargens, 2010b). The EMRs and MhMRs in the Individual Interior (See Figures 7 & 8 below) are very reflective of each other as they have a similar strategy to manage mental health problems. The overarching themes in the Individual Interior of both EMRs and MhMRs seem to, first, understand and engage with inner thoughts and feelings through self-reflection, then accept those thoughts and feelings in order to finally change, let go or replace the thoughts, feelings, and emotions that are causing the mental distress in the first place (See Figures 7 & 8).

EMRs’ research suggests that the management strategies that are mainly focused on reducing negative thoughts, emotions and feelings, i.e., using emotion-focused coping strategies, can be counterproductive in managing eco-anxiety, as they can give rise to wishful thinking and unrealistic optimism, which may not be good for an individual’s pro-environmental behaviour (Ágoston, Csaba, et al., 2022; Ojala et al., 2021; Pihkala, 2022b). Therefore, there’s a need for a realistic hope and

optimism, that could be accompanied by action, i.e., meaning-focused coping (Ágoston, Csaba, et al., 2022; Ojala et al., 2021; Pihkala, 2022b). However, the MhMRs from Sensa focus on emotion-focused coping, which although can be very effective with normal forms of anxiety and stress (Hofmann et al., 2012), may discount its alignment in managing eco-anxiety with other mental health issues, especially, drawing on the Integral Theory learnings, if it doesn't have a strong collective-coping base (Wamsler et al., 2022), as is the case in this situation (See Figure 6) (Sensa.Health, 2023). More is discussed in the section 5.3 which engages in analysing the alignment between EMRs and MhMRs.

Both, the scientific literature on EMRs and MhMRs from Sensa are heavily influencing the Individual Interior sphere of the Integral Framework Model, making it more prominent than the rest of the spheres (See Figures 5 & 6). This focus on the Individual Interior is an expected result since mental health issues are experienced on an individual level and therefore the solutions to these mental health issues are also focused on removing the issues from the individual level only (Bosqui, 2020). In the field of psychology, there has been a propensity to focus on individual experiences and approximating individual treatments, while largely ignoring the extensive social systems and interpersonal relationships, which goes back into the roots of the social discourse - of the Story of Separation - where an individual is considered completely separate from the other individuals and its surroundings (Bosqui, 2020; Hendersson & Wamsler, 2020). A similar understanding on the importance of the connections between individual, society and nature can be taken out from the Integral Theory, which is highly dependent on the interrelationships between the four quadrants, ultimately providing the “correct” perspective on the ontology of being (Duffy, 2020).

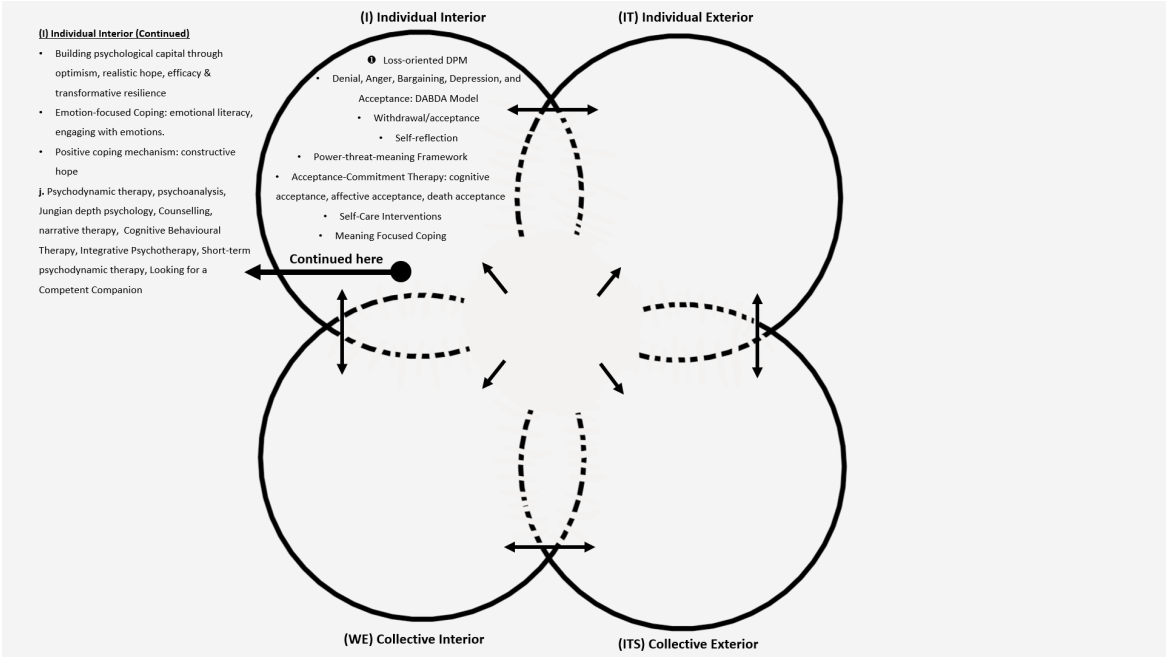


Figure 7. EMRs in the Individual Interior (I) Sphere

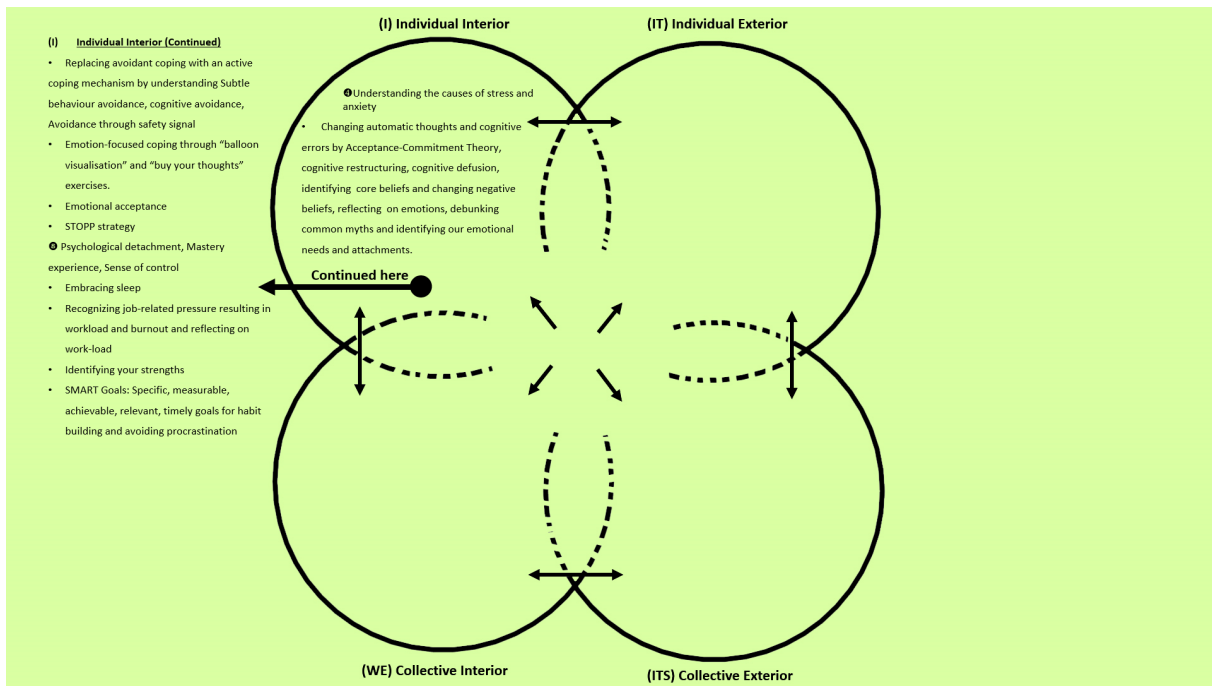


Figure 8. Sensa MhMRs in the Individual Interior (I) Sphere

5.2.2 Individual Exterior (IT)

The Individual Exterior or “IT”, is the behavioural sphere (Esbjörn-Hargens, 2010b). When dealing with gruesome situations, people tend to either internalise or externalise problems which bring out different patterns of behaviours and emotions varying from person to person (Plenty et al., 2021). As the name suggests, internalising problems bring out symptoms of anxiety, fear, sadness, etc., while externalising problems bring out the symptoms such as substance abuse, binge eating, etc. (Plenty et al., 2021). The EMRs and MhMRs in the Individual Exterior are primarily linked to managing symptoms related to such externalising problems – therefore relating to the behavioural sphere of the Integral Framework. EMRs and MhMRs in the Individual Exterior can also be the activities or actions that are performed by a person to manage eco-anxiety, such as climate action.

The Individual Exteriors of EMRs and MhMRs are quite different from each other (See Figures 9 & 10 below), which is contrary to the reflexivity in their Interiors. While both suggest similar strategies of doing regular mindfulness exercises, the Individual Exterior of EMRs focuses on different schools of psychological management strategies for eco-anxiety, such as, problem-focused coping, CBT, motivational interviewing, etc. and the Individual Exterior of MhMRs focuses on habit-building and relaxation techniques which are inspired from CBT (See Figures 9 & 10). Similar to the emotion-focused coping, EMR research suggests that strategies mainly focused on the problem-focused coping, can be counterproductive in managing eco-anxiety as well, since it could lead to burnout and confrontation resulting in disturbed relations, causing even stronger eco-anxiety (Ágoston, Csaba, et

al., 2022; Pihkala, 2022b). However, no such focus on problem-focused coping mechanisms is found in Sensa (See Figure 10), which is complementing the alignment of EMRs and MhMRs.

Lastly, the spheres of the Individual Exterior have a smaller impact than the Individual Interior in both EMRs and MhMRs, but have a much larger impact than the Collective Interior and Exterior spheres (See Figures 11 and 12).

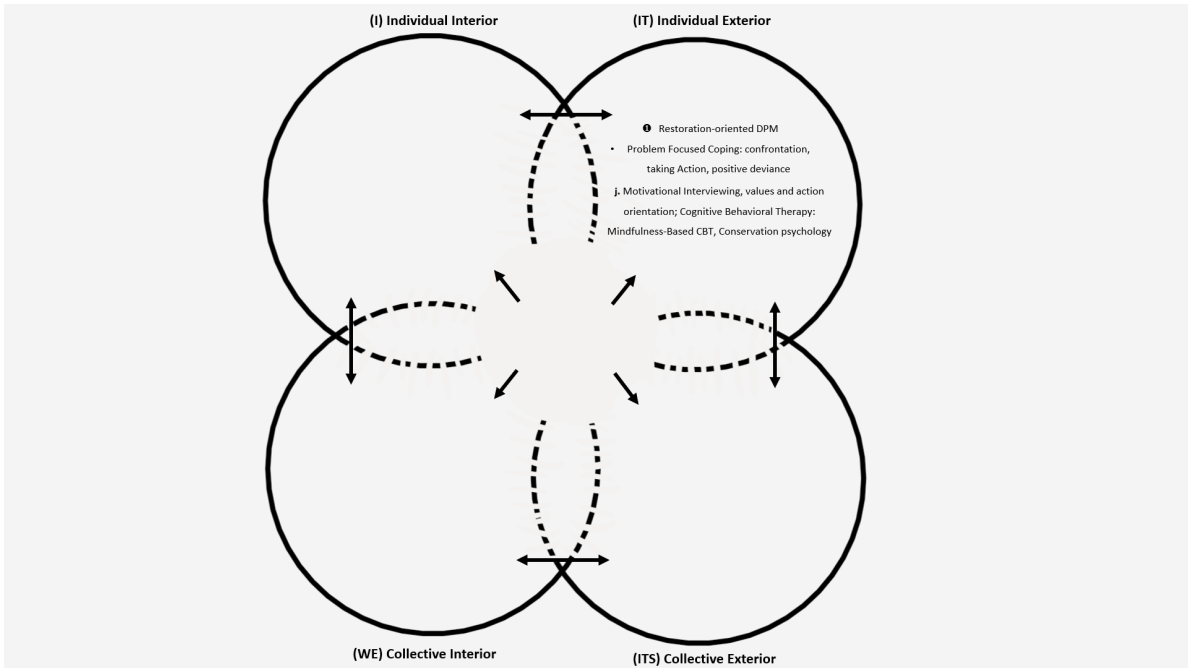


Figure 9. EMRs in the Individual Exterior (IT) Sphere

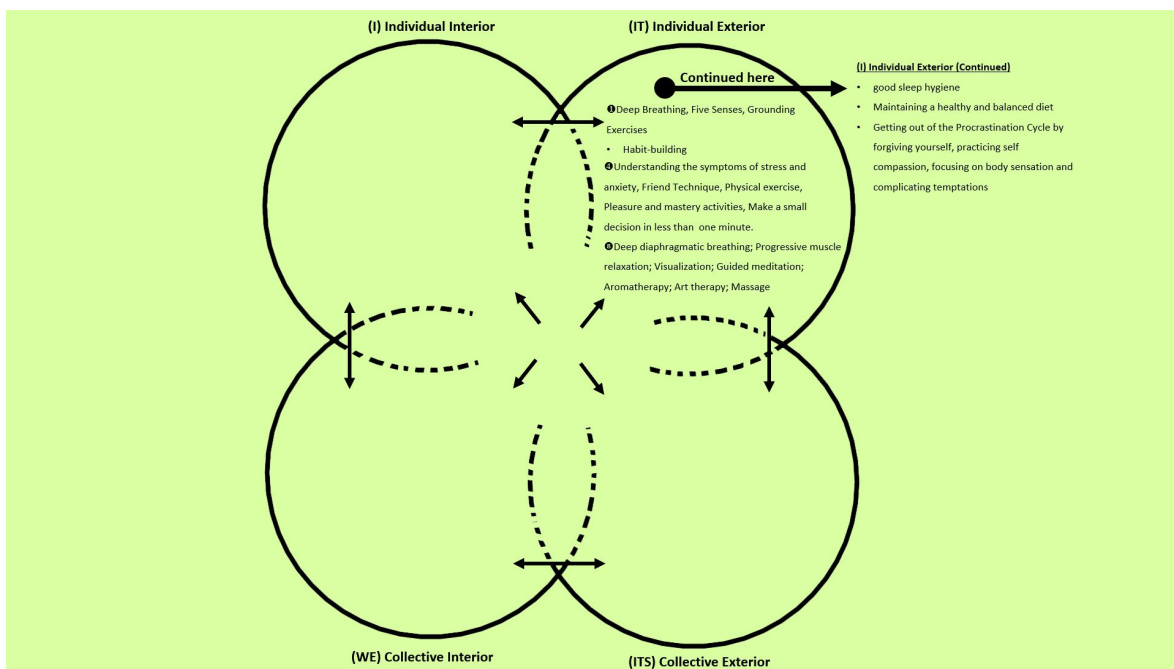


Figure 10. Sensa MhMRs in the Individual Exterior (IT) Sphere

5.2.3 Collective Interior (WE) and Exterior (ITS)

The Collective Interior or “WE”, is the cultural sphere and the Collective Exterior or “ITS”, is the social sphere (Esbjörn-Hargens, 2010b). It can be clearly seen through the figures 11 and 12 that there is a lack of research and work done in relation to the social and cultural dimensions, as compared to the dimensions discussed above.

While there are four EMRs in the collective spheres – “global-local linkage”, community resilience and two methods of psychotherapy (See Figure 11), there are no MhMRs present in the collective spheres of Sensa, leaving the Integral Framework model in Figure 12 completely empty.

Sensa has the MhMRs such as “Seeking social support” and “Social connections” (See Figure 14), that are part of their ‘self-paced lessons’ application feature, impacting the collective spheres but they also impacting other spheres and therefore included in the next section instead of being in this section. Similarly, in the EMRs, there are responses that impact multiple spheres, including the collective ones (See Figure 13), therefore included in the next section. However, there are more EMRs influencing the collective spheres, that are interlapping and integral, in comparison to the MhMRs in Sensa.

A split can be seen in between the Individual and the collective spheres – resonating to the theory of separation (Hendersson & Wamsler, 2020). This split can also be connected to the common the misconception that the interior and the individual are completely disjointed from the exterior and the collective of a person – and that issues like eco-anxiety, which are experienced individually, wouldn’t conjure collective impacts or cannot be experienced collectively at all, when in fact, the individual and collective are constantly influencing and shaping each other (Pihkala, 2022b). Researchers have therefore cautioned regarding the over emphasis on the “I” or the Intentional sphere when it comes to eco-anxiety (Pihkala, 2022b).

Additionally, in the SLR, there are no articles that focus specifically on the collective dimensions of eco-anxiety management, showing another research gap when it comes to EMRs. In the SLR, only the article from Pihkala (2022b) engages in the discussion on the importance of the social and cultural spheres, but at the end mainly focuses on individual processes of eco-anxiety in the research.

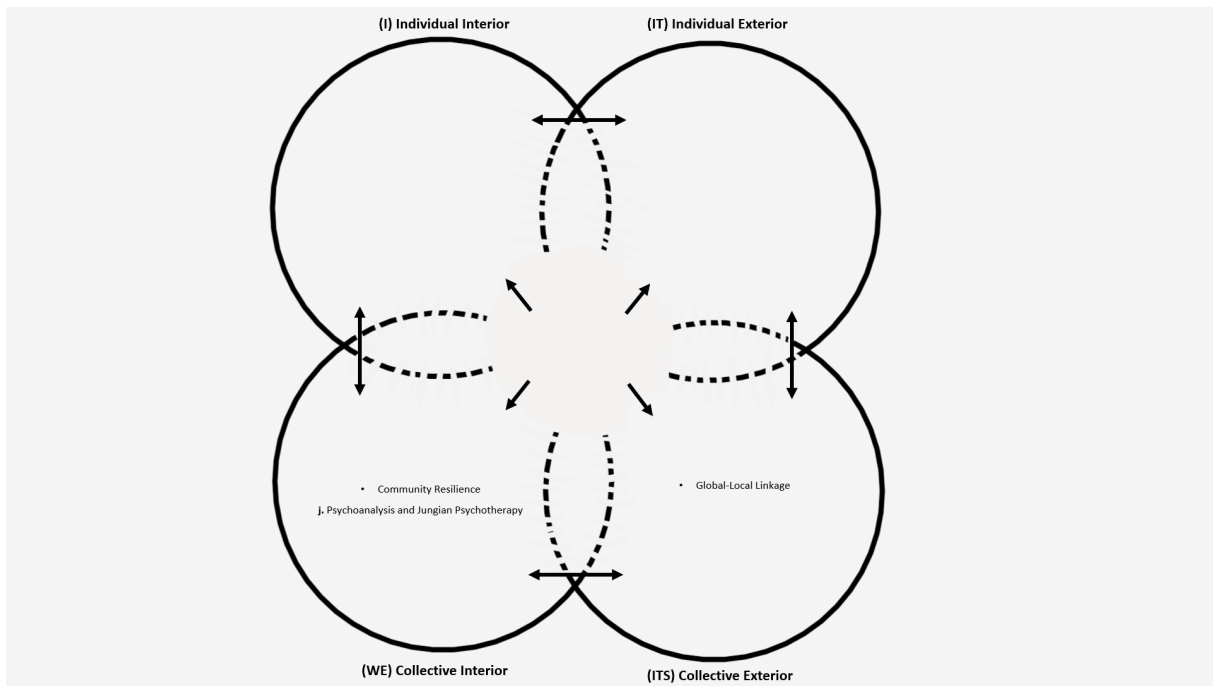


Figure 11. EMRs in the Collective Interior (WE) and Exterior (ITS)

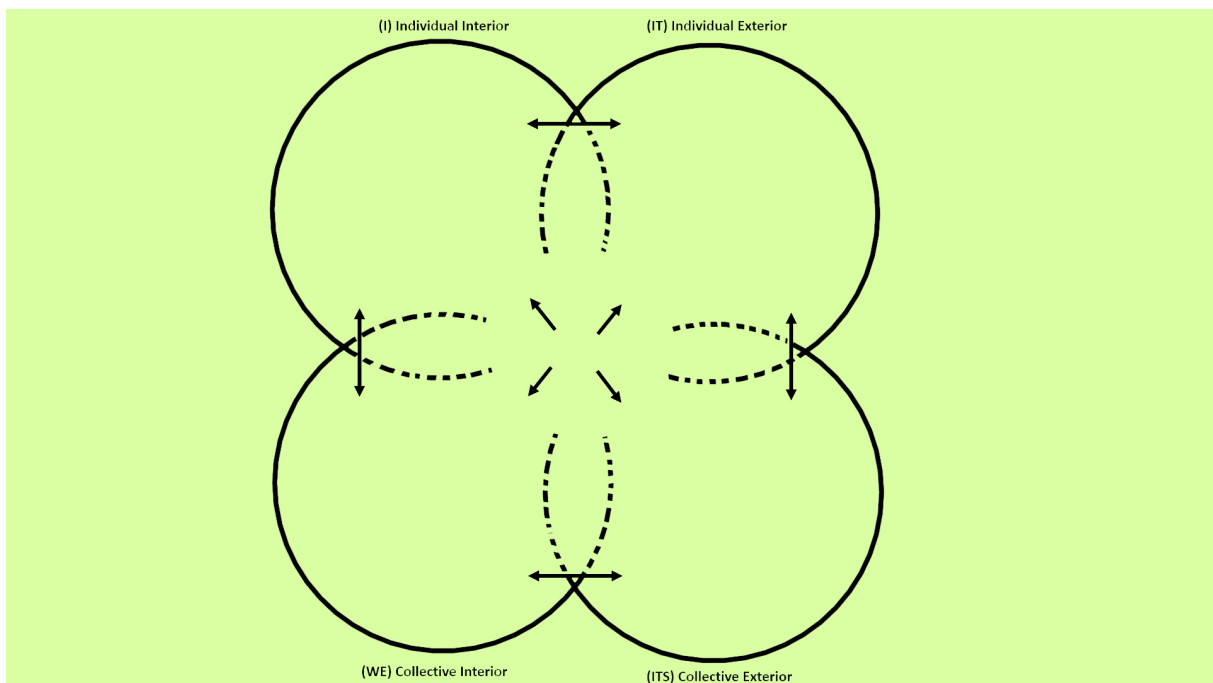


Figure 12. Sensa MhMRs in the Collective Interior (WE) and Exterior (ITS)

5.2.4 Interlapping (I + IT, IT + ITS, etc.) and Integral Responses (I + WE + IT + ITS)

The interlapping responses are the EMRs and MhMRs that influence two spheres of the Integral model at the same time. For example, the EMR of Dual Process Model of Bereavement (DPM) (Pihkala, 2022b) as an EMR impacts two spheres of an individual (See Figure 13) - the Intentional (I) sphere through Loss-Oriented DPM and the behavioural sphere (IT) through Restoration-oriented

DPM. Integral Responses are the responses that impact all spheres of the Integral model, such as, the MhMR of ‘Self-paced lessons’ from Sensa.Health (2023) (See Figure 14).

There is a collective agreement in the scientific literature on the importance of having a “balance” to be able to manage eco-anxiety (Eriksson et al., 2022; Gunasiri et al., 2022; Guthrie, 2023; Léger-Goodes et al., 2022; Nice et al., 2022; Pihkala, 2017), indicating that EMRs and their corresponding spheres from the Integral model should have a balance between each other as well, as even too much of hope, optimism, climate-action, etc., may create issues (Eriksson et al., 2022; Pihkala, 2017). This importance for balance also corresponds to what Wamsler et al explained in their research related to the Integral Framework, where they noted, “... [Integral Theory] stipulates that if we choose to work on only some of these four dimensions and exclude others, efforts will not lead to sustainable transformation, as the dimensions are co-constitutive and interdependent.” (2022, p. 4).

Therefore, Integral EMRs (See Figure 13) like Coping flexibility (Pihkala, 2022b), “Action, Grieving, and Distancing” (Pihkala, 2022b), “Head, heart and hands” (Gislason et al., 2021), Integrated Knowledge to Action (Gislason et al., 2021), etc., play a significant role in managing eco-anxiety as they are innately balanced due to their integrated impact on all of the four spheres of the Integral model. This can be backed up by the evolution in the research found through the SLR, where no integral EMRs are identified in the literature prior to 2021 (See Table 2), highlighting a recent change in the focus of EMRs, as the prominence of an integral perspective to deal with eco-anxiety is growing.

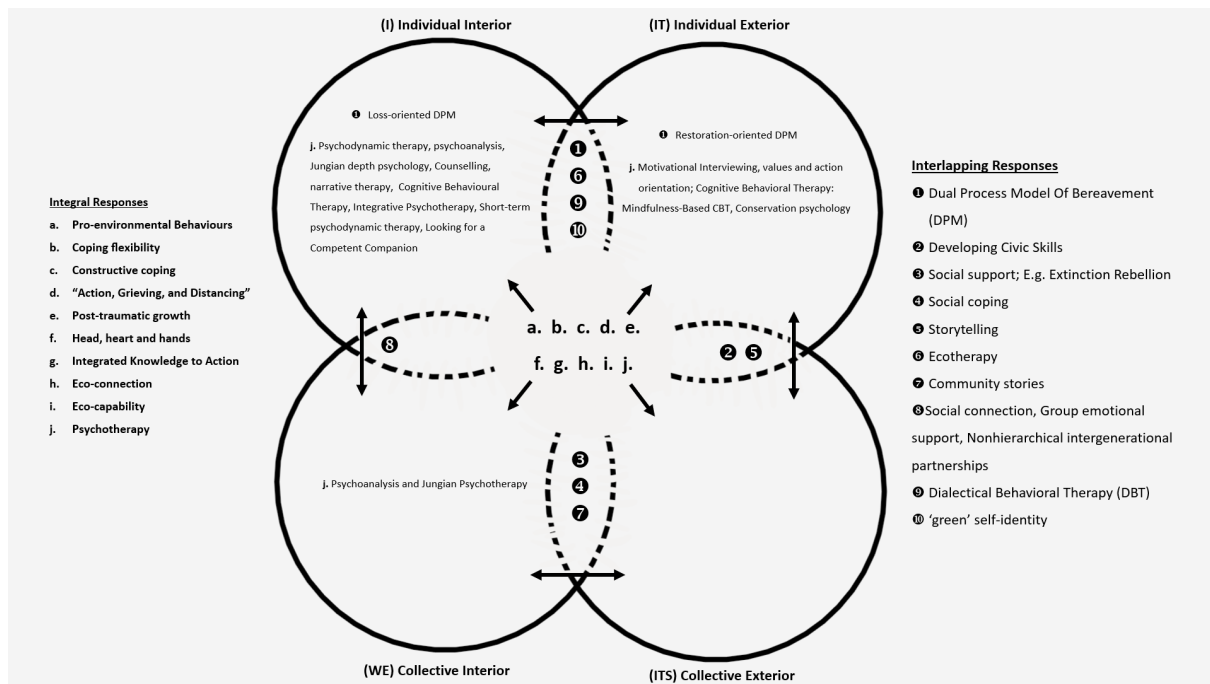


Figure 13. EMRs that are Interlapping (I + IT, IT + ITS, etc.) and/or Integral (I + IT + WE + ITS)

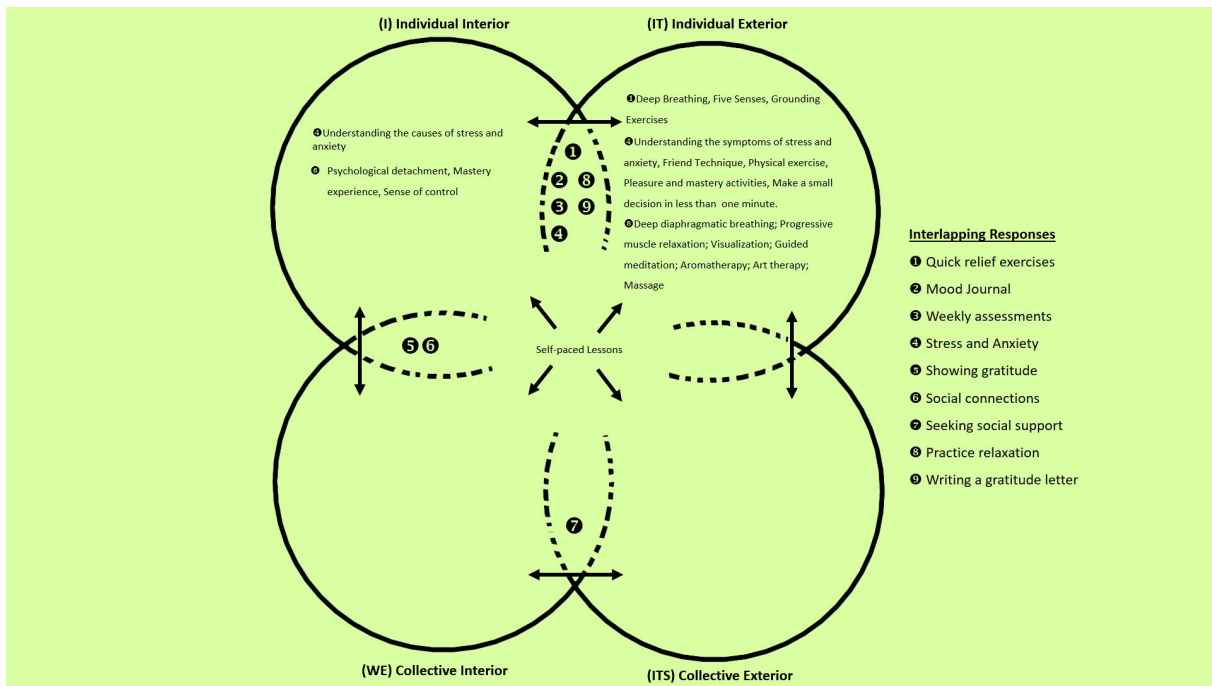


Figure 14. Sensa MhMRs that are Interlapping (I + IT, IT + ITS, etc.) and/or Integral (I + IT + WE + ITS)

5.3 Alignment of MhMRs in Sensa with the EMRs

In section 5.3, a discussion is presented on the findings from the collective analysis of the EMRs and MhMRs found from the SLR and Sensa application respectively. The collective analysis is explained in the methodology section (See Chapter 4.3.2), its main findings are depicted through Table 3 & Figure 15 (See below). To quantify the similarity and aversion between MhMRs and EMRs, the thesis employees five terminologies, namely,

1. Highly Complementing (When the MhMR is very similar to the corresponding EMRs)
2. Somewhat Complementing (When the MhMR is a bit similar to the corresponding EMRs)
3. Somewhat Discounting (When the MhMR has some aversion to the EMRs)
4. Highly Discounting (When the MhMR is completely aversed to the EMRs)
5. No corresponding EMRs (When the MhMR does not have any corresponding EMRs)

These terms are then colour coded and used in the Table 3 and Figure 15 to represent the findings systematically.

Colours and their explanation

	Highly Complementing		Highly discounting
	Somewhat Complementing		Somewhat discounting
	No Corresponding EMRs		

Table 3 content: The table is divided into four segments (the serial number, the MhMRs from Sensa, the EMRs corresponding to Sensa's MhMRs and lastly the alignment) and four sections (Individual Interior, Individual Exterior, Collective Interior and Collective Exterior). Because some MhMRs are interlapping, they are repeated in the table in different sections (E.g., Social Support).

Table 3. Analysis of the alignment between EMRs and Sensa's MhMRs

Sr. No.	Sensa Responses	EMRs found through SLR	Align ment
Individual Interior			
1	Quick relief exercises	maintaining balance, self-care interventions	
2	Mood journal	Self-reflection	
3	Weekly assessments	Self-reflection	
4	Understanding Stress and Anxiety	mental health communication	
5	Understanding the causes of stress and anxiety	psychoanalysis	
6	Automatic thoughts and cognitive errors	flexible coping	
7	Acceptance and commitment therapy (ACT).	ACT	
8	Cognitive restructuring	flexible coping; constructive coping	
9	Identify 3 rules and assumptions you live by and define new negative ones	Self-reflection	
10	Cognitive Defusion	withdrawal, distancing	
11	Identifying core beliefs and changing negative beliefs	Self-reflection; constructive coping	
12	Using Discovery experiments		
13	Using a Hypothesis-testing experiment	Building psychological capital	
14	Identifying and naming the emotions that you feel	emotion-focused coping	
15	Debunking common myths and learning to accept our emotions	Self-reflection	
16	emotional need and Attachment theory	personal values and action orientation	
17	Understanding Emotional avoidance	Withdrawal/acceptance	
18	Understanding Subtle behaviour avoidance	Withdrawal/acceptance	
19	Understanding cognitive avoidance	Withdrawal/acceptance	
20	Understanding Avoidance through safety signals	Withdrawal/acceptance	
21	Replace avoidant coping with an active coping mechanism	Power-Threat-Meaning Framework, Acceptance-Commitment Therapy (ACT)	
22	Think of a win-win situation		
23	Emotion Focused coping	emotion-focused coping	
24	Balloon visualisation	Mindfulness-Based Cognitive Behavioural Therapy; Self-reflection	
25	Buy your thoughts	self-care interventions	
26	Emotional acceptance	affective acceptance: ACT	
27	STOPP strategy	maintaining balance	
28	Learning to take some time for yourself to destress	maintaining balance	
29	Psychological detachment	Problem avoidance/denial/ wishful thinking, Disavowal	
30	Relaxation	distancing; withdrawal	
31	Mastery experience	connecting with lyrical self, distancing	
32	Sense of control	building psychological capital	
33	Embracing sleep	Self-Care Interventions; maintaining balance	
34	Recognizing job-related pressure resulting in workload and burnout	Self-Care Interventions; maintaining balance	
35	Reflecting on work-load	Maintaining balance	
36	Identifying your strengths, things that bring joy	Building Psychological Capital; remembering joy; upholding meaningfulness	
37	SMART Goals: Specific, measurable, achievable, relevant, timely goals	Taking Action: Problem-focused coping; constructive coping	

Individual Exterior			
38	Quick relief exercises	Mindfulness-Based Cognitive Behavioural Therapy	
39	Deep breathing	Mindfulness-Based Cognitive Behavioural Therapy	
40	Five senses	Mindfulness-Based Cognitive Behavioural Therapy; Self-reflection	
41	Grounding exercises	Mindfulness-Based Cognitive Behavioural Therapy	
42	Habit-building strategies	Building Psychological Capital; connecting with their lyrical self	
43	Motivation, ability, and prompts to help build a habit.	Building Psychological Capital; connecting with their lyrical self	
44	Mood journal	Self-reflection; DBT	
45	Stress and anxiety management	Building Psychological Capital; psychotherapy	
46	Understanding the symptoms of stress and anxiety	Dialectical Behavioural Therapy (DBT); psychotherapy	
47	Friend Technique	Building Psychological Capital	
48	Physical exercise	Maintaining balance	
49	Pleasure and mastery activities	Maintaining balance (distancing); Head, heart and hands engagement	
50	Make a small decision in less than 1 minute	Taking Action: Problem-focused coping	
51	emotional regulation	Learning to manage emotions	
52	Forgive yourself for procrastinating		
53	Practice self-compassion	Building Psychological Capital	
54	Focus on the sensations in your body	Mindfulness-Based Cognitive Behavioural Therapy; Self-reflection	
55	Complicate temptations		
56	Practice relaxation: Deep diaphragmatic breathing; Progressive muscle relaxation; Visualization; Guided meditation; Aromatherapy; Art therapy; Massage	Mindfulness-Based Cognitive Behavioural Therapy; Connecting with Their Lyrical Self	
57	Good sleep hygiene	Self-Care Interventions	
58	Maintaining a healthy and balanced diet	Maintaining balance; Self-Care Interventions	
59	Writing a gratitude letter	Restoration-oriented DPM	
Collective Interior			
60	Seeking social support & showing gratitude	emotional support by joining groups	
61	social connections	social connection	
Collective Exterior			
62	Seeking social support & showing gratitude	Social support	
Integral Responses			
63	Self-Paced Lessons	Coping flexibility; Maintaining balance	

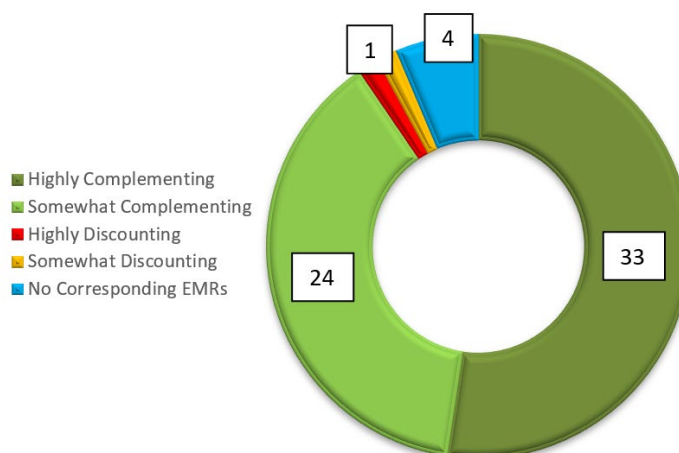


Figure 15. MhMRs and their alignment with EMRs

Through the analysis, it is found that 33 MhMRs from Sensa are highly complementing the corresponding EMRs and 24 MhMRs are somewhat complementing. One MhMR (Emotion-focused coping (Sensa.Health, 2023)) is somewhat discounting the EMRs and one MhMR (Psychological Detachment (Sensa.Health, 2023)) is highly discounting the EMRs. Lastly, there are no corresponding EMRs to four MhMRs from Sensa, explaining they are completely unrelated to the EMRs and possibly neither discount nor compliment the EMRs. These four non-corresponding MhMRs from Sensa are, complicate temptations, forgive yourself for procrastinating, think of a win-win situation and use discovery experiments (Sensa.Health, 2023).

The findings presented above show a positive alignment between Sensa application and eco-anxiety management. This indicates that if Sensa application integrated eco-anxiety management with its other mental health strategies, it is likely that the existing MhMRs from Sensa will not impede or constrict eco-anxiety management. This result of Sensa's MhMRs and their alignment with eco-anxiety management could be generalised to other mental health applications similar to Sensa, since this thesis uses Sensa as a case study to understand the larger perspective.

However, the MhMRs of emotion-focused coping and psychological detachment may need to be transformed or altered in order to accommodate eco-anxiety management in the Sensa application. This is because, emotion-focused strategies give rise to wishful thinking and unrealistic optimism, hindering pro-environmental behaviour (Ágoston, Csaba, et al., 2022; Pihkala, 2022b). Eco-anxiety scholars, therefore, recommend using meaning-focused coping strategies instead of emotion-focused coping for eco-anxiety management, as it eliminates the issues related to unrealistic optimism (Ágoston, Csaba, et al., 2022; Ojala et al., 2021). Psychological detachment, on the other hand, leads to disavowal (Pihkala, 2022b) and problem avoidance (Ágoston, Csaba, et al., 2022) which can impact people undesirably. Detachment may help with managing eco-anxiety to an extent but negatively affects pro-environmental behaviour (Ágoston, Csaba, et al., 2022). Instead, "distancing", as a part of EMRs such as "Action, Grieving, Distancing" (Pihkala, 2022b) and "Acceptance/Withdrawal" (Ágoston, Csaba, et al., 2022), are much more helpful and adaptive than detachment, as they are in effective oscillation with action, grieving and acceptance, helping people by giving them the time to recharge themselves without going through complete detachment (Ágoston, Csaba, et al., 2022; Pihkala, 2022b).

It is important to note that both emotion-focused coping and psychological detachment are used in a different context in Sensa, and are very effective techniques to manage anxiety, depression and stress (Sonnentag, 2012; Hofmann et al., 2012) and therefore do not discredit the capability of Sensa as a mental health management application. Emotion-focused coping is a well-recognised strategy

from the family of CBT (Hofmann et al., 2012), and psychological detachment, which is used in Sensa in the context of reducing stress during vacation time, is a proven way to reduce work-related stressors by disengaging (Sonnentag, 2012).

Even though there are a total of 56 out of 63 MhMRs that are highly or somewhat complementing the EMRs, it does not mean that Sensa already has the tools required to deal with eco-anxiety. It only implies that most of the existing MhMRs align with eco-anxiety management strategies.

In order to integrate eco-anxiety management in mental health management applications, the EMRs explained through the Integral Framework (See Figure 5) could be taken into consideration. More specifically, since the Individual Interior of MhMRs from Sensa and EMRs are quite reflective of each other (See Chapter 5.2.1), more attention could be placed on the EMRs that focus on rest of the three spheres and on the EMRs that are Integral in nature.

EMRs such as “community building” (Ágoston, Csaba, et al., 2022), “collective engagement, community resilience” (Ojala et al., 2021) and “Storytelling” (Eriksson et al., 2022, Wang et al., 2023) could be integrated in Sensa and/or other mental health applications to manage eco-anxiety by creating online communities for people dealing with eco-anxiety, providing them a safe space to interact amongst each other.

Similarly, EMRs that focus on the connection with nature and being in nature (Walshe et al., 2022; Westoby et al., 2022), could be integrated in the application using prompts, challenges and exercises that engage people with nature, for example, a prompt such as “Take a 15-minute walk in nature and listen to all the sounds surrounding you during the walk” could help people get out of their houses and [re-]connect with nature (Westoby et al., 2022), surpassing the geographical limitations of a mobile application. Sensa already has daily activities and exercises that prompt users to walk, swim, cycle, (See Appendix 2) (Sensa.Health, 2023) but to help in eco-anxiety management, the application could have specific nature context.

Lastly, since the people who are worst impacted by eco-anxiety are the younger generations, the geographically marginalised and the impoverished (Baudon & Jachens, 2021; Coffey et al., 2021; Dodds, 2021), mental health applications may be a better fit for eco-anxiety management if they could provision free access to the application, with perhaps, mobile ads and a premium version without ads and consisting of extended features – for the purpose of monetisation (Appel et al., 2020).

5.4 Limitations of the Thesis

The first limitation of this thesis arises from the aim of the thesis. To get an integral perspective on EMRs and their alignment with the mHealth application Sensa, the age, gender and location-related cross-sectional aspects are overlooked in this thesis, therefore the case study lacks a perspective on the intersectional and cross-sectional factors.

Another limitation is that, the EMRs and their alignment with the Sensa application are only applicable to a user has low or medium-level eco-anxiety, since Sensa is primarily used for moderate to mild symptoms (Sensa.Health, 2023). If someone has extreme or severe eco-anxiety and has day-to-day functional impairments, then proper consultations with a psychiatrist or a psychologist might be necessary.

Spirituality is an important component of the EMRs such as “Head, heart and hands engagement” (Gislason et al., 2021) and “Eco-capability” (Walshe et al., 2022), therefore, even though spirituality is not considered an EMR, it is indirectly included. However, as spirituality is not discussed explicitly in this thesis, it creates limitations. Spirituality, religion and belief in God are the human components that may impact eco-anxiety and human psyche. Many authors from the SLR discuss upon the importance of spirituality when it comes to eco-anxiety (Budziszewska & Jonsson, 2022; Gislason et al., 2021; Guthrie, 2023; Lomas, 2019; Walshe et al., 2022; Westoby et al., 2022). This thesis refrains from the discussion on spirituality as an EMR, because, although spirituality can impact human psyche, it is not a psychological strategy to managing eco-anxiety in itself - a psychological strategy is a “specific action applied to achieve the enhancement of psychological skills by using one or more psychological techniques” (Kruk et al., 2017, p.80), and spirituality is neither an action nor a skill or technique.

5.5 Personal Reflections

There is a need for, perhaps, an official handbook of terms in Sustainability Science or in Ecopsychology for EMRs and Eco-anxiety, as it creates confusion for the researcher as different researchers use different terms to explain similar phenomena (Coffey et al., 2021).

Distinguishing different EMRs and MhMRs into the dimensions of the Integral Framework (Wilber, 2005) was difficult because of how an EMR can be interlapping with two or more spheres. It is also possible that an EMR could be pertaining to one sphere but may impact and influence some other spheres. For example, mindfulness exercises (Baudon & Jachens, 2021; Sensa.Health, 2023) are in the

Individual Exterior, or the behavioural sphere, but can also influence the other three spheres of the Integral Framework.

There are two ways of dealing with a stressful situation such as eco-anxiety - one is adaptive and the other is maladaptive (Pihkala, 2022b). An issue that I faced while data collection of the EMRs, was that some articles in the systematic literature review also mentioned maladaptive responses or “less adaptive” (Ágoston, Csaba, et al., 2022) but as this research focuses only on adaptive responses, it was, at times, misleading and confusing for me to analyse and find “adaptive” EMRs. At the end, I included EMRs that were ‘less adaptive’, but have explained throughout the thesis, if they had any kind negative impacts.

6 Conclusion and Future Recommendations

The purpose of this thesis was to thematically analyse EMRs and MhMRs from Sensa, a mental health mobile application, by employing the AQAL Framework of Integral Theory (Wilber, 2005) and to find the alignment between them. To achieve this, a qualitative content analysis of 24 peer-reviewed articles found through a Systematic Literature Review was performed to obtain different EMRs, while the MhMRs were extracted from the Sensa app. Furthermore, a modified model of Integral Framework was applied to these EMRs and MhMRs as an analytical framework.

The results demonstrate that there is an overall lack of research and responses in the collective spheres of the Integral Framework, in both the EMRs and MhMRs. Results also show that while eco-anxiety could be managed with Sensa and similar mobile applications, an emphasis on emotion-focused coping and psychological detachment techniques as responses could be detrimental (Ágoston, Csaba, et al., 2022). Therefore, strategies such as meaning-focused coping, instead of emotion-focused coping (Ojala et al., 2021); “Action, Grieving, Distancing” (Pihkala, 2022b) and “Acceptance/Withdrawal” (Ágoston, Csaba, et al., 2022) instead of psychological detachment could be better at accommodating eco-anxiety management in Sensa. Regardless, emotion-focused coping and psychological detachment in the context of Sensa and its targeted mental health issues are effective techniques (Sonnetag, 2012; Hofmann et al., 2012), and therefore, do not discredit the capability of Sensa as a mental health management application.

Scientific literature stresses on having a “balance” to be able to manage eco-anxiety (Eriksson et al., 2022; Gunasiri et al., 2022; Guthrie, 2023; Léger-Goodes et al., 2022; Nice et al., 2022; Pihkala, 2017), explaining that different EMRs may need to have a balance between each other as well. Therefore, EMRs such as Coping flexibility (Pihkala, 2022b), “Action, Grieving, and Distancing” (Pihkala, 2022b), “Head, heart and hands” (Gislason et al., 2021), Integrated Knowledge to Action (Gislason et al., 2021), etc., play a significant role in managing eco-anxiety as they are innately balanced due to their integrated impact on all of the four spheres of the Integral model.

While the results of this thesis are favourable, they should be construed in light of several limitations and the future researches that could address these limitations. First, the cross-sectional aspects of eco-anxiety, such as age, gender and location, as well as the intersectional aspects, are overlooked in this thesis, in order to obtain a holistic perspective. But there is a possibility that such factors such influence the extent of eco-anxiety experienced by people (Soutar & Wand, 2022). Therefore, future studies could focus on cross-sectional and intersectional aspects. Second, this research is limited to

the theoretical and conceptual idea of the alignment of MhMRs from Sensa with eco-anxiety management, with no reassurance that it can be practically feasible or user-friendly. Therefore, it is recommended to have future research on the user-experience of eco-anxiety management within mental health applications. Third, this research does not make use of all the levels, lines, states and types of the AQAL Framework of Integral Theory (Wilber, 2005), due to this thesis's scope, but studies in the future could further analyse EMRs using all the aspects of the AQAL framework to get a deeper understanding of the missing links in the integral perspective of eco-anxiety. Lastly, eco-anxiety management can go beyond exercising psychological strategies – as seen in Mishra & Gerencheal (2022). Even though these kinds of non-psychological eco-anxiety management responses are out of the scope of this thesis, they show potential. Gislason et al (2021) suggested an approach called “Asset-based Community Development” (ABCD) that creates an opportunity for people to engage in pro-environmental behaviour and develop community sense through the iterative process of knowledge creation, research, and maintaining relationships, which is ultimately helpful in alleviating eco-anxiety. Therefore, researchers could also focus on discovering eco-anxiety measures that are beyond psychological interventions, similar to ABCD.

The question “are we prepared for eco-anxiety?” was posed in the title of this thesis. While it cannot be commented upon if we are fully prepared to tackle eco-anxiety; from the learnings of this thesis and other eco-anxiety literature, one can surely see the seriousness and the weight that is being put on such mental health problems and the efforts in the mitigation as well. There are several organizations, including the Climate Psychiatry Alliance and Climate Psychology Alliance, that are presently working towards providing resources and “toolkits” to help people cope with eco-anxiety (Wang et al., 2023). Additionally, the APA Task Force on Climate Change has also been promoting international research workshops and scientific papers on a variety of psychological topics related to climate change (Wang et al., 2023). This thesis and its insights on the applicability of eco-anxiety management responses in mHealth mobile applications will certainly aid in such preparations for eco-anxiety.

7 References

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Appendix 1

Currently, there are no applications that aid in eco-anxiety-related mental health management. This information was found through Sensor Tower, a tool that contains information about all mobile applications, their downloads, reviews, revenue, etc., globally. Information retrieved on 27 March 2023.

The search was made using 5 keywords in mobile apps, their names, descriptions, subtitles, promo texts or in-app purchases, a worldwide search including all devices (iPhone, iPad, Android devices) and in all categories (health & wellness, books, entertainment, finance, etc.)

Keywords used for the search:

- 1. Eco-anxiety - 0 applications (See Image 1)
- 2. Ecological anxiety - 0 applications (See Image 2)
- 3. Environmental anxiety - 0 applications (See Image 3)
- 4. Climate change distress - 0 applications (See Image 4)
- 5. Climate anxiety - 3 applications, none of which are focused on mental health. (See Image 5 & 6)

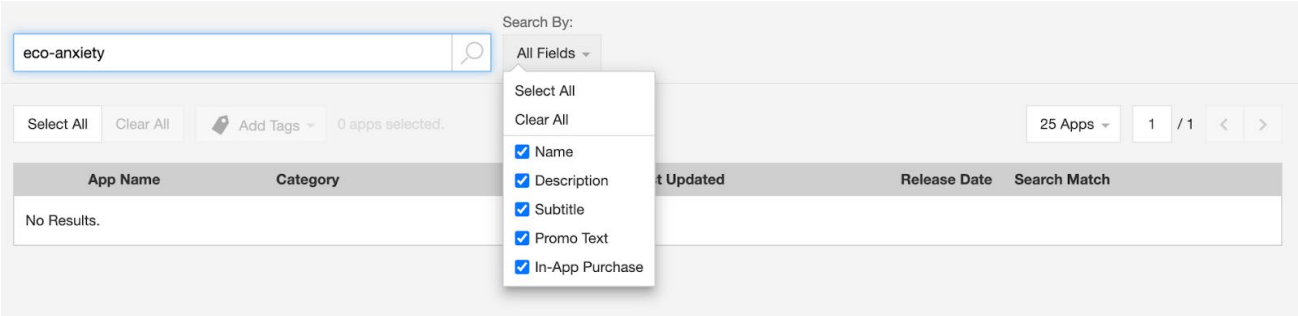


Image 1

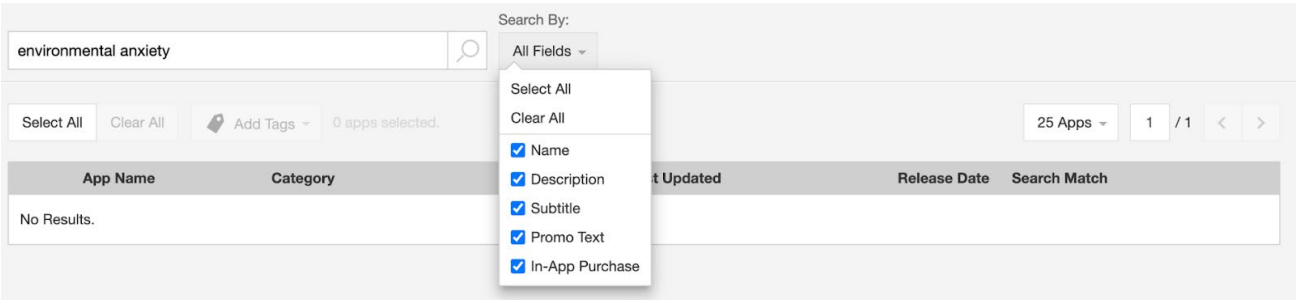


Image 2

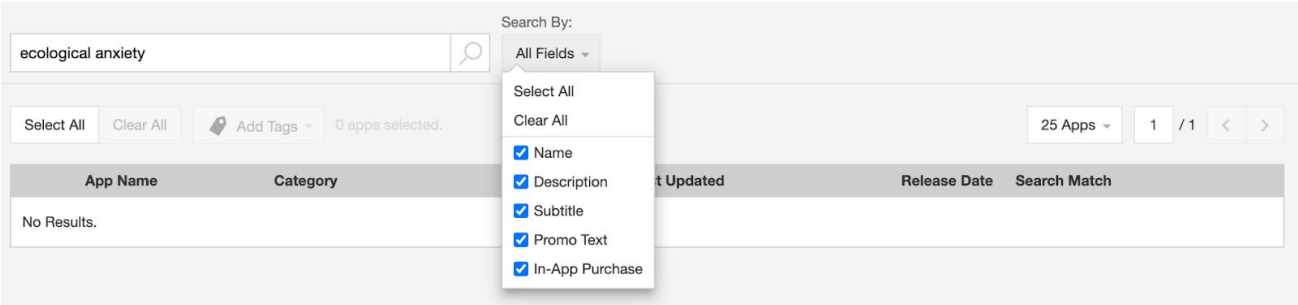


Image 3

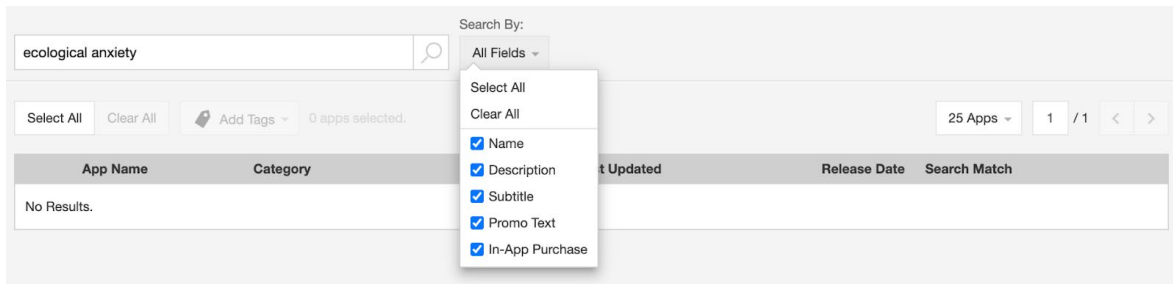


Image 4

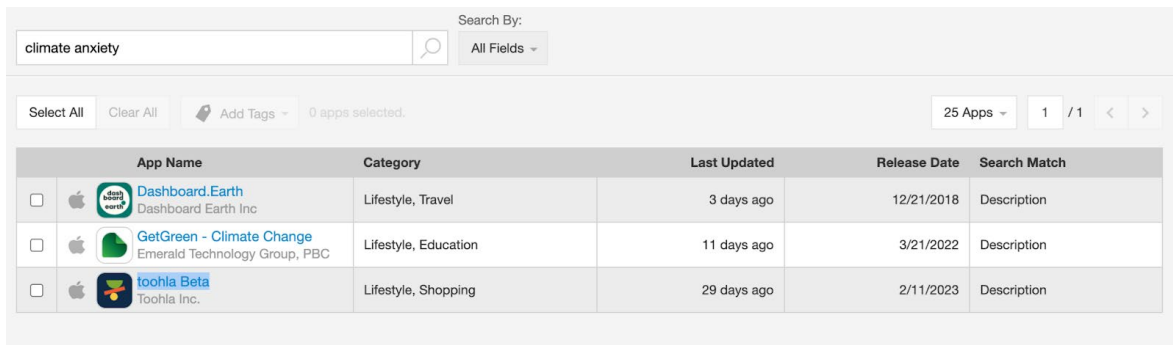
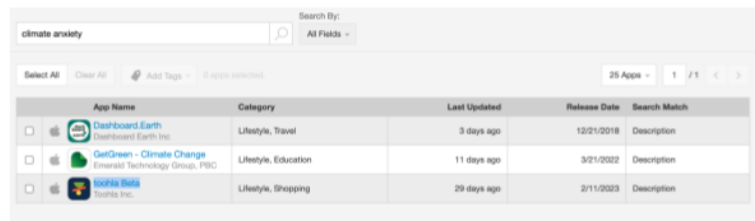


Image 5

Climate anxiety - 3 apps



Dash Board Earth app - about climate solutions, tracking your impact, **not mental health focused**. Keyword found in "description".



Get Green Climate Change app - eco friendly sustainability, focused into taking actions to take care of climate change, **not mental health focused**. Keyword found in "description".



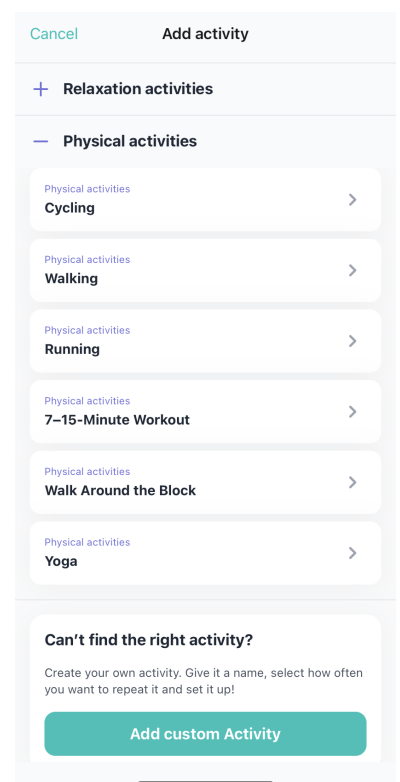
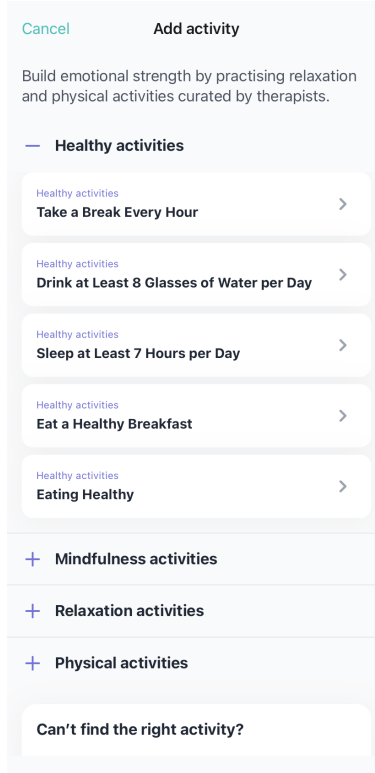
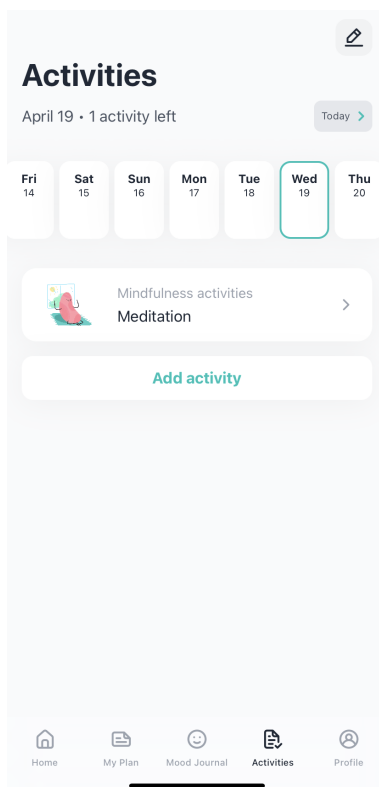
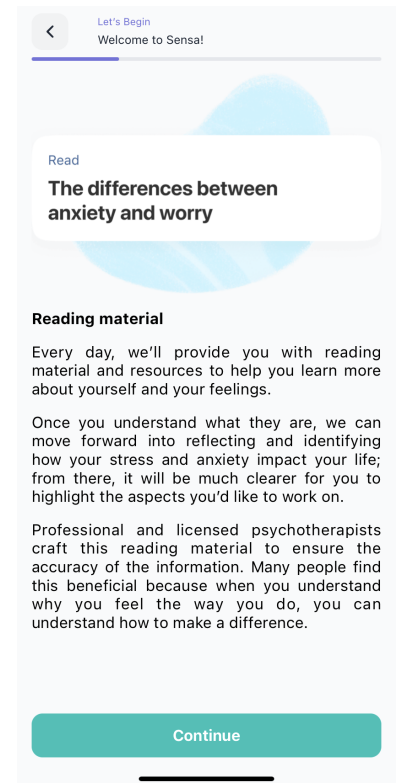
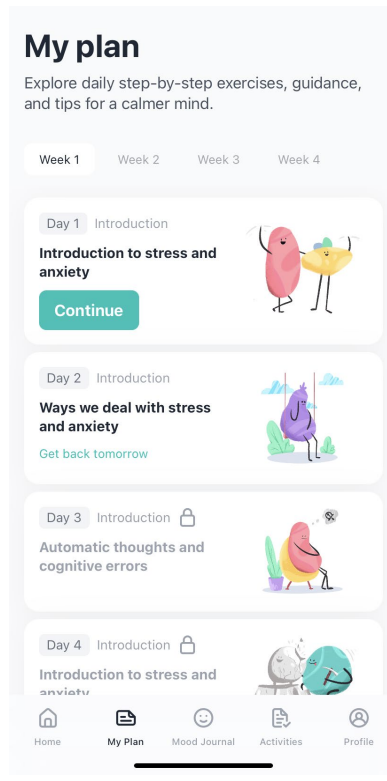
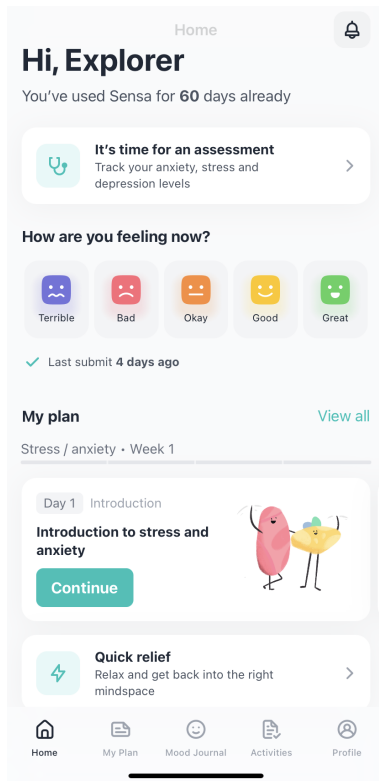
Toohla app - empowers you to track, reduce and offset your pollution, **not mental health focused**. Keyword found in "description".

Image 6

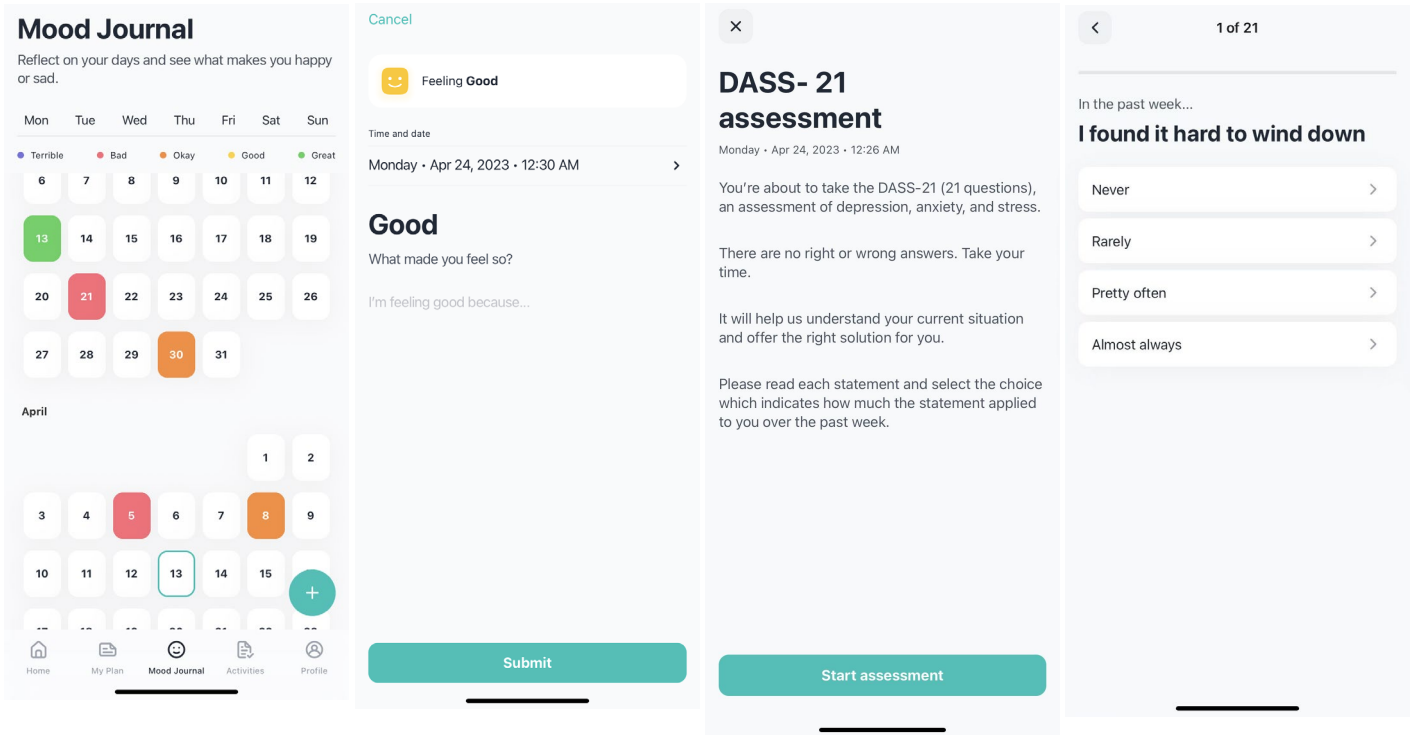
Appendix 2

Sensa Application Features' Screenshots (Retrieved from Sensa App from iPhone 11 on 13 April 2023 & 24th April 2023)

1. Self-paced lessons and tasks



2. Mood journal and weekly assessments



3. Quick relief exercises

