THESIS

Analysis and design process of an insomnia therapy app for Chinese youth

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ABSTRACT

Sleep is an essential component of health and well-being. The effect of insomnia, whether as a primary or secondary symptom, is a major health concern and should be closely studied and examined across all age groups. There is growing evidence that the effect of insomnia on adolescent's functioning is comparable to that of other major psychiatric disorders (e.g., mood disorders, anxiety disorders, etc.). Insomnia is associated with significant negative consequences, impairing functioning across a number of emotional, social, cognitive, and physical domains (Carskadon, 1999; Johnson, Roth, Schultz, & Breslau, 2006; Roberts, Roberts, & Duong, 2008b; Wolfson & Carskadon, 1998).

This thesis mainly studies the sleep status of Chinese adolescents, has conducted in-depth research on the causes and factors affecting insomnia in Chinese adolescents, as well as investigating and understanding the common treatment methods for insomnia. Finally, through the analysis of user population portraits, user characteristics and user needs, combined with existing insomnia treatment methods and methods, an app that assists users in solving insomnia or poor sleep quality problems is designed: Sweat Sleep.

This app will provide a questionnaire obtained by an intelligent algorithm when the user uses it for the first time, and initially collect data such as the user's sleep status and expectations for sleep quality. Secondly, the application provides four major module functions, which respectively provide suggestion function, treatment function, social function, and account management function. By providing a variety of functional modules, the application can serve a variety of users, including users with mild insomnia, who only need some mild sleep aids to improve sleep quality. It also includes some users with severe insomnia who need more professional insomnia treatment or the assistance of professionals such as psychologists. Additionally, it can also meet the narrative needs of some users, and talk to strangers about the stressful things in life, so as to soothe their emotions.

This app is dedicated to calming the minds of users with insomnia in a natural way, and gradually helping everyone to improve their sleep therapy and solve insomnia problems.

ACKNOWLEDGEMENTS

This is a long journey, with many setbacks, learning, growth and rewards. Without the support, love, kindness, knowledge and generosity of those around me, I would not be able to complete this chapter in my life.

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Additionally, I would like to thank all of the professors, supervisors, and teachers throughout my academic career who have made a positive impact in my life's journey; their kindness, compassion, and willingness to help and believe in me as a student and individual has done wonders for me.

I am grateful for my parents whose constant love and support keep me motivated and confident. My accomplishments and success are because they believed in me. Deepest thanks to my siblings, who keep me grounded, remind me of what is important in life, and are always supportive of my adventures. Finally, I owe my deepest gratitude to my boyfriend Sultan and my cat Kelly. I am forever thankful for the unconditional love and support throughout the entire thesis process and every day. Thank you, with the deepest of love. I would also like to acknowledge my friends and others who have loved me and stuck by me during this time, and in their ever-present support and investment in me as a person.

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Chapter 1

Introduction

Figuer 1. Bochen, 2019 Staying up by choice while paying for insomnia treatment

1.1. Background

Sleep is a necessary component of an individual's health and wellbeing. With the socioeconomic development and the acceleration of the aging of the population, the incidence rates of mental disorders and psychosocial problems is increasing worldwide. Mental disorders are by far the second largest burden of disease in the world. So far, the disease burden caused by mental disorders ranks second in the world.

In China, the burden of diseases caused by mental disorders accounts for 13% of all non-communicable diseases (Que, Lu and Shi, 2019). Therefore, mental health has become a major public health problem and social problem. In order to promote mental health, the Chinese government has promulgated a series of policies and regulations, as well as reform measures. In addition, the upcoming "China Brain Project" will also focus on some mental illnesses, such as autism, depression and dementia, in order to improve mental health research in China.

Insomnia, which is characterized by difficulty initiating and maintaining sleep and/or waking up too early, appears to be one of

Figuer 2. China Daily, 2008 World Day of Sleep to boost awareness of insomnia

the most frequent sleep complaints in the general population (Roth, 2007). More and more people are suffering from sleep problems. The "2021 Exercise and Sleep White Paper" jointly issued by China Sleep Research Association and other institutions shows that there are currently more than 300 million people in China who have sleep disorders (tellerreport.com,2021). An analysis of big data collected active users of Xiaomi services and products among 450 million people revealed that:

• more than 36% of the Chinese population suffered from frequent insomnia three times or more in a week.
• 36.7 % of them were people born after 1990
• 67.4 % of people had purchased products that claim to enhance sleep, of whom 62% were born after 1990.

Han Fang, president of the China Sleep Research Society, said: "Our research has found that more and more young people have sleep problems. Many people have had minor problems in the past that have evolved into serious sleep disorders. We should pay more attention to this trend." Guo Xiheng, director of the Sleep and Respiratory Center at Beijing Chaoyang Hospital affiliated to Capital Medical University, said the number of patients with sleep problems

has increased dramatically in the past decade. Guo, who has studied sleep problems for 36 years, said nearly a third of the patients are under the age of 30. "The ratio was about 10 percent 10 years ago," he said.

A study by the Sleep Research Association found that the incidence of sleep disorders in China was 38.2 percent (Zekun,2019), far higher than what the World Health Organization calls the international level of 27 percent. Therefore, the problem of insomnia is a serious problem in Chinese society, especially among the younger generation.

Figuer 3. Knott, 2021

Figuer 4. Douglas, 2020

1.2. Mental health in China

Mental health has become a growing issue in China. Experts have estimated that about 173 million people living in China are suffering from a diagnosable psychiatric disorder (Xiang et al., 2012). The desire to seek treatment is largely hampered by China's strict social norms (and the stigma that comes with them), as well as religious and cultural beliefs about personal reputation and social harmony. Despite the Government's efforts to expand mental health care services and legislation, China still faces a shortage of mental health professionals and a lack of access to professionals in rural areas.

Despite the continuous development of mental health services in China, there are still a large number of patients with mental illness who are not treated and diagnosed. The above-mentioned strong stigma associated with mental illness, the lack of mental health professionals and experts, and the specific cultural expression of mental illness may play a role in this difference.

Adolescents with mental health problems also often experience sleep disorders. In many cases, sleep disorders may even cause symptoms and dysfunction during the day. Experts have found that

53% of people involved have a common disease, and that the early psychology and individual existence of a common mental illness last longer (Johnson, Roth and Breslau, 2006). Although it is not clear whether insomnia precedes

mental disorders, it is clear that sleep disorders are usually associated with various emotional difficulties in adolescents, which includes depression, anxiety, irritability, fear, anger, tension, self-reported self-esteem, mood swings, lack of concentration and increased behavioral problems.

Chapter 2

Literature Review
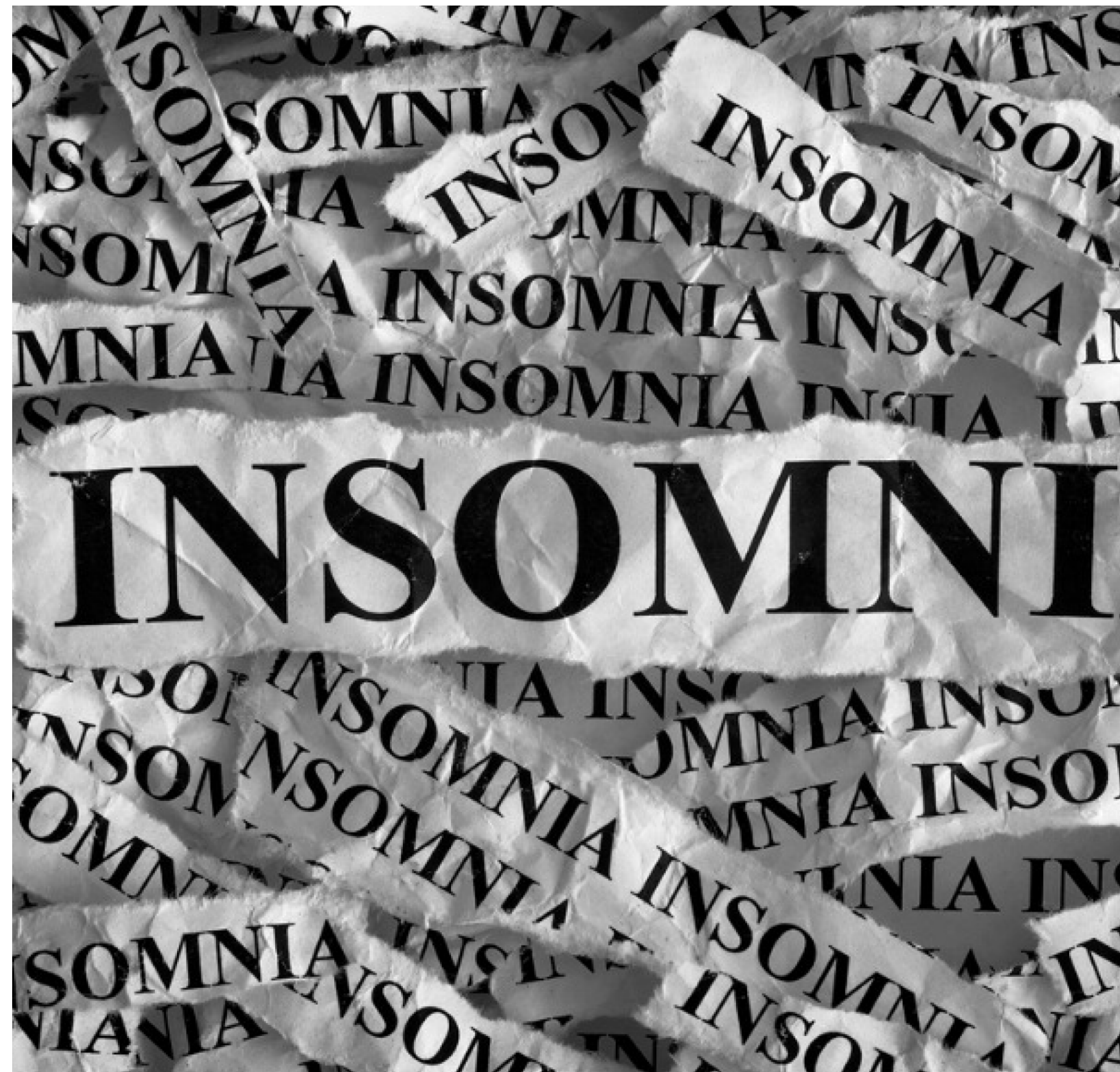
Figuer 5. Sharon, 2020 Insomnia Definition

2.1. Insomnia Defined

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Figuer 6. Rosanne, 2017

2.2. Symtoms of Insomnia

With insomnia, sleeping difficulties occur at least three nights per week for more than three months.

Insomnia negatively affects daytime functioning, leading to one or more of the following symptoms:

• General tiredness
• Problems with concentration or memory
• Difficulty falling asleep at night
• Sleepiness during the day
• Waking up during the night
• Waking up too early
• Not feeling well-rested after a night's sleep
• Daytime tiredness or sleepiness
• Irritability, depression or anxiety
• Difficulty paying attention, focusing on tasks or remembering
• Increased errors or accidents
• Ongoing worries about sleep

Figuer 7. None, 2018

2.3. Types of Insomnia

Transient insomnia (mild)
This is characterised by only brief periods of poor sleep, perhaps a night here and there.

Acute insomnia (moderate)
Acute insomnia is when a person has persistent sleeping problems that lasts for more than three weeks.

Chronic insomnia (severe)
Chronic insomnia lasts for extended periods of time.

People with more severe insomnia (acute or chronic) usually have difficulty falling asleep (sleep onset), staying asleep (sleep maintenance) and/or seem to wake up too early in the morning.

As a consequence, insomniacs are at a far greater risk of workplace injury or accidents.

Complications of
Insomnia

Psychological
- Lower performance
- Slowed reaction time
- Risk of depression
- Risk of anxiety disorder

Other:
Overweight or obesity

High blood
pressure

Poor immune
system function

Risk of
heart disease

Risk of
diabetes

Figuer 8. Mayo, 2009 Complications of insomnia
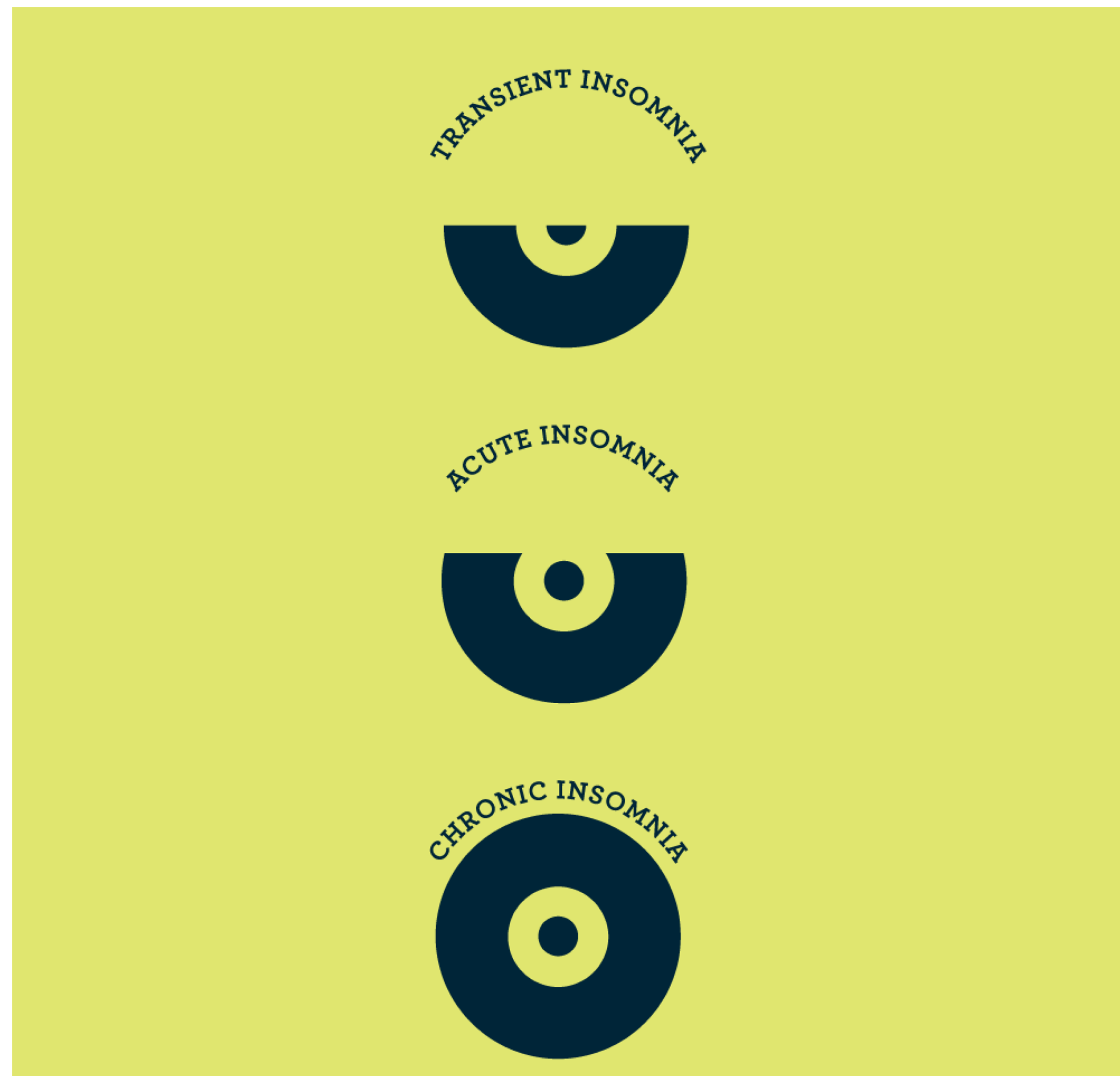
2.4. Main Causes and Risk Factors

Insomnia can result from a range of physical and psychological factors. Often, the cause is a temporary problem, such as short-term stress. In some other instances, insomnia stems from an underlying medical condition. Common causes include:
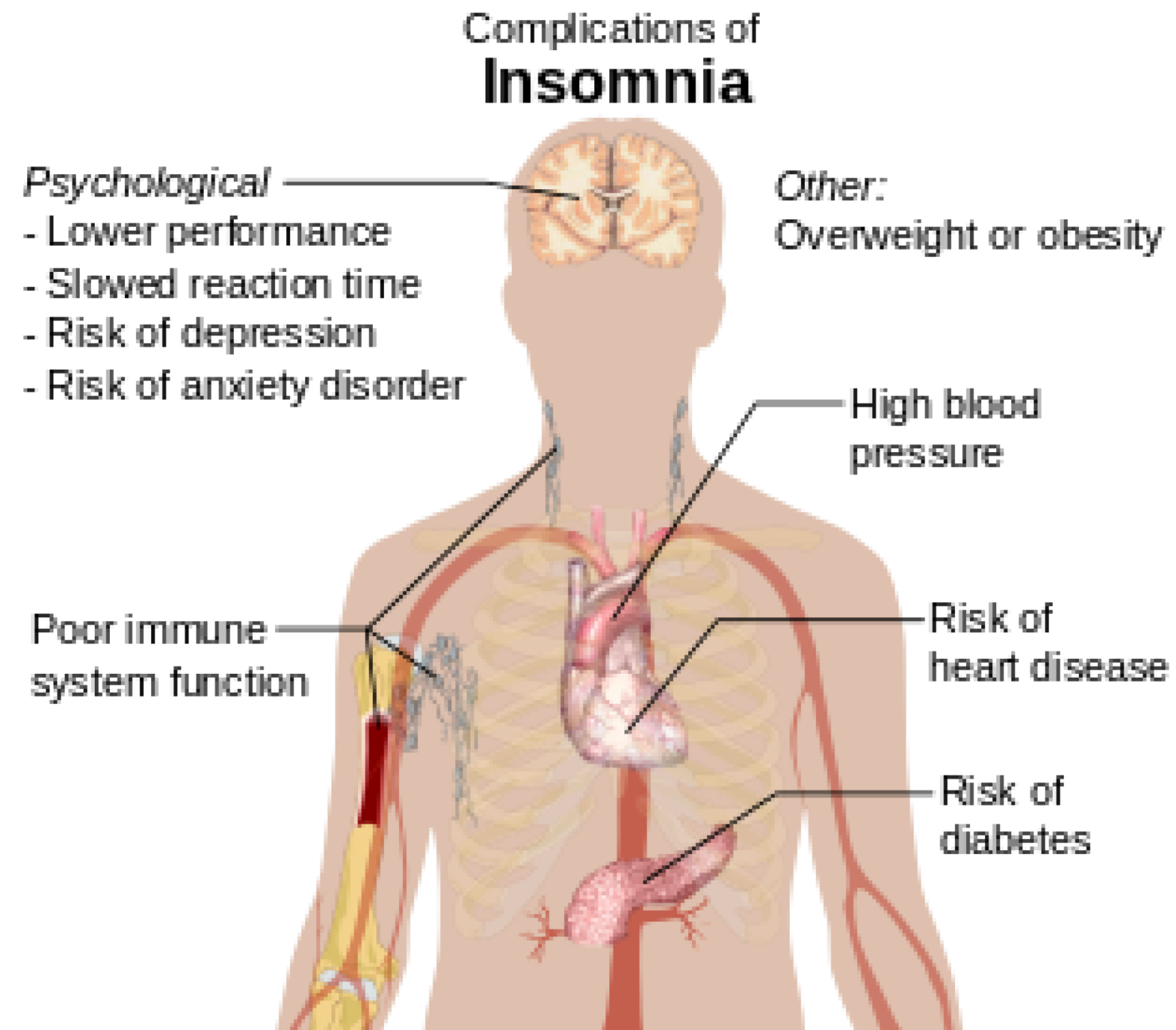
- having jet lag, switching shifts at work, or dealing with any other changes to the body's internal clock
- the room being too hot, cold, or noisy, or the bed being uncomfortable
- caring for someone in the house, if it disrupts sleep
- getting too littleTrusted Source physical exercise
- having night terrors or bad dreams
- using recreational drugs, such as cocaine or ecstasy

Often, symptoms of another health issue or natural transition cause difficulty sleeping. During menopause, for example, hormonal changes can lead to night sweats, which can interrupt sleep. In people with Alzheimer's disease, changes in the brain disrupt or change sleeping patterns.

Insomnia can occur at any age, but some factors increase the risk.
These include:
- traveling across time zones
- working in shifts
- being older
- using caffeine, medications, drugs, or alcohol
- having a family history of insomnia
- experiencing significant life events
- being pregnant
- going through menopause
- having certain physical or mental health conditions
- being female

2.5. Physiology Structure Affect Insomnia

2.5.1. Sleep Mechanisms

Two internal biological mechanisms–circadian rhythm and homeostasis–work together to regulate when you are awake and sleep.

Circadian rhythms direct a wide variety of functions from daily fluctuations in wakefulness to body temperature, metabolism, and the release of hormones. They control your timing of sleep and cause you to be sleepy at night and your tendency to wake in the morning without an alarm. Your body's biological clock, which is based on a roughly 24-hour day, controls most circadian rhythms. Circadian rhythms synchronize with environmental cues (light, temperature) about the actual time of day, but they continue even in the absence of cues.

2.5.2. Anatomy of Sleep

Several structures within the brain are involved with sleep:

The hypothalamus, a peanut-sized structure deep inside the brain, contains groups of nerve cells that act as control centers affecting sleep and arousal. Within the hypothalamus is the suprachiasmatic nucleus (SCN) – clusters of thousands of cells that receive information about light exposure directly from the eyes and control your behavioral rhythm. Some people with damage to the SCN sleep erratically throughout the day because they are not able to match their circadian rhythms with the light-dark cycle. Most blind people maintain some ability to sense light and are able to modify their sleep/wake cycle.

The brain stem, at the base of the brain, communicates with the hypothalamus to control the transitions between wake and sleep. (The brain stem includes structures called the pons, medulla, and midbrain.) Sleep-promoting cells within the hypothalamus and the brain stem produce a brain chemical called GABA, which acts to reduce the activity of arousal centers in the hypothalamus and the brain stem. The brain stem (especially the pons and medulla) also

plays a special role in REM sleep; it sends signals to relax muscles essential for body posture and limb movements, so that we don't act out our dreams.

The thalamus acts as a relay for information from the senses to the cerebral cortex (the covering of the brain that interprets and processes information from short- to long-term memory). During most stages of sleep, the thalamus becomes quiet, letting you tune out the external world. But during REM sleep, the thalamus is active, sending the cortex images, sounds, and other sensations that fill our dreams.

The pineal gland, located within the brain's two hemispheres, receives signals from the SCN and increases production of the hormone melatonin, which helps put you to sleep once the lights go down. People who have lost their sight and cannot coordinate their natural wake-sleep cycle using natural light can stabilize their sleep patterns by taking small amounts of melatonin at the same time each day. Scientists believe that peaks and valleys of melatonin over time are important for matching the body's circadian rhythm to the external cycle of light and darkness.

The basal forebrain, near the front and bottom of the brain, also promotes sleep and wakefulness, while part of the midbrain acts as an arousal system. Release of adenosine (a chemical by-product of cellular energy consumption) from cells in the basal forebrain and probably other regions supports your sleep drive. Caffeine counteracts sleepiness by blocking the actions of adenosine.

The amygdala, an almond-shaped structure involved in processing emotions, becomes increasingly active during REM sleep.

Figuer 9. Lucy, 2018

2.6. Therapy

2.6.1. Yoga Therapy

Yoga is a gentle and restorative way to wind down your day. A national survey found that over 55% of people who did yoga found that it helped them get better sleep. Over 85% said yoga helped reduce stress. You can use supportive props like bolsters, blankets, and blocks to make poses comfortable so that you can stay in the pose for longer and continue to breathe.

Your breath is key to be able to relax in these poses. Breath in yoga is equally important—if not more important—as the physical pose. Use a gentle and calming yoga breath technique called Ujjayi Breath, also known as Ocean Breath or Victorious Breath. Inhale deeply through the nose. With your mouth closed, exhale through your nose while constricting the back of your throat as if you are saying "ha" but keep your mouth closed. Practice these yoga poses right before bedtime and stay in them about 3 to 5 minutes each. Use your Ocean Breath in each pose, with the exception of Corpse Pose, where your breath returns to normal.
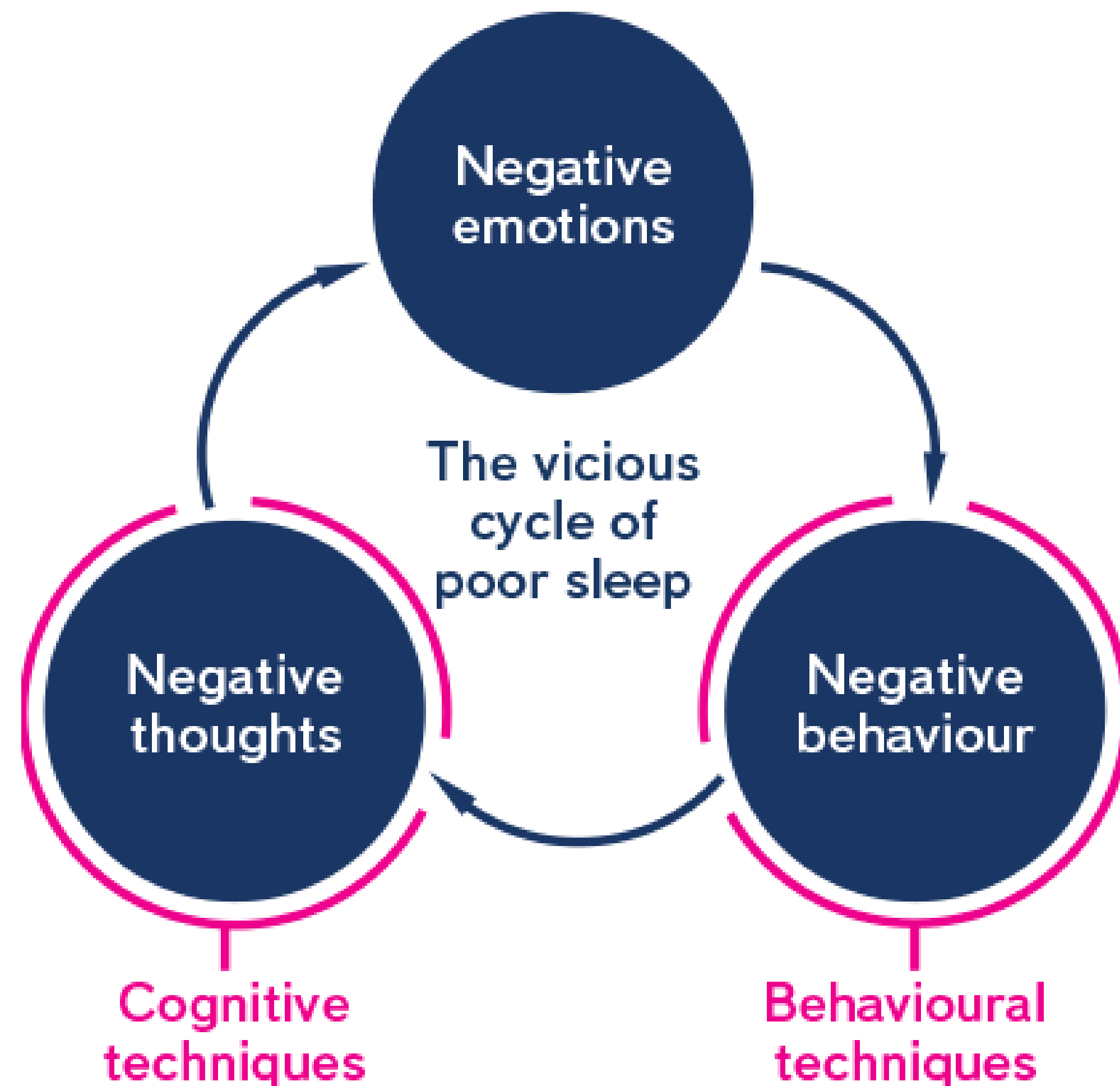
The vicious cycle of poor sleep

- Negative emotions
- Negative thoughts — Cognitive techniques
- Negative behaviour — Behavioural techniques

Figuer 10. Colin, 2004 The vicious cycle of poor sleep and how CBT for insomnia can help overcome it.

2.6.2. CBT-I Therapy

Cognitive behavioral therapy for insomnia (CBTI) is the most common psychotherapeutic treatment for insomnia (CBTI; Baron, et al, 2017). It is a 4 to 6 session treatment program that can help people who have difficulty falling asleep, staying asleep, or find that sleep is unrefreshing. CBTI includes a combination of behavior change procedures that include sleep hygiene education, stimulus control, sleep restriction therapy and relaxation therapy, as well as cognitive restructure.

Sleep hygiene education outlines a variety of behavioral change techniques designed to help individuals sleep better (Kloss, et al, 2011). By introducing new behavioral techniques that promote healthier sleep, the psychological education provided from this model seeks to reduce the permanent elements of the Spielman's behavioral mode. These techniques to help you sleep better which includes Limiting caffeine and other substances before bed, having a bedtime routine, keeping a consistent sleep and wake time, having a dark, quiet room and so on. Additionally, these techniques are the opposite of the previously mentioned safe sleep behaviors, as the behavioral changes outlined in sleep hygiene education actually promote sleep rather than restrict a person's sleep (Morin, et al.,

1999). Poor sleep hygiene is not the primary cause of a person suffering from insomnia, while as a person improves their sleep hygiene, they are better able to regulate the long-term factors that can prolong insomnia.

The first component of CBTI is stimulus control, a technique designed to limit the total amount of time spending in the bedroom other than sex and sleep. In order to achieve the effect of stimulus control, it requires people to wake at the same time every morning, sleep only in the bedroom and, most importantly, leave the bedroom if they cannot fall back asleep after 15 minutes (Baron, et al, 2017; Kloss, et al, 2010). Stimulus control works on the classical conditioned aspect of insomnia because it tries to reduce the increased connection between arousal and the bedroom.

The second component is sleep restriction therapy, it focuses on the classic conditioned reflex aspects of insomnia, but emphasizes an alternative approach, which is to focus a person's sleep time on the average time of their normal sleep (Kloss, et al 2010). Once the average has been determined from the sleep diary, the clinician will use the average to indicate when the patient should fall asleep. For instance, if the patient only sleeps for four hours a night and usually

wakes up at eight o'clock in the morning, he would then be instructed to go to bed at four o'clock in the morning. In this way, it limits the amount of time the patient is awake in bed and helps increase the body's natural sleep drive by catering to the rest time the body actually needs (Kloss, et al, 2010). This promotes more adequate sleep patients are only sleeping in bed, thus reducing the amount of time they spend awake.

Another important component of CBTI is relaxation therapy, it uses progressive muscle relaxation and diaphragmatic breathing to reduce physical and cognitive arousal. The purpose of progressive muscle relaxation is to release tension that builds up during stress. Progressive muscle relaxation involves tensing different muscle groups for a few seconds, then releasing tension into the next muscle group after 30 seconds of relaxation (Kloss, et al, 2010). Individuals will be able to become more aware that their body is stressed through practice and actively release that tension, thus making it easier to fall asleep. In addition, diaphragmatic breathing slows breathing by focusing the breath on the diaphragm rather than on the chest. Breathing from the diaphragm activates the parasympathetic nervous system, which calms the body by lowering heart rate and blood pressure (Pal, et al., 2004)

The goal of the cognitive therapy in CBTI is to de-emphasize the importance of that patient's maladaptive thoughts, an example of which being, "If I do not get enough sleep then I won't be able to perform well at school" (Baron, et al, 2017). These thoughts tend to present themselves over and over again while the patient is trying to initiate sleep, thus increasing arousal levels, which in turn prevents sleep. The main way these maladaptive thoughts are combated is through cognitive restructuring which is the process of allowing the patient to realize that their maladaptive thoughts are inaccurate (Baron, et al, 2017)

Figuer 11. Ahtezaz, 2015 Market Analysis
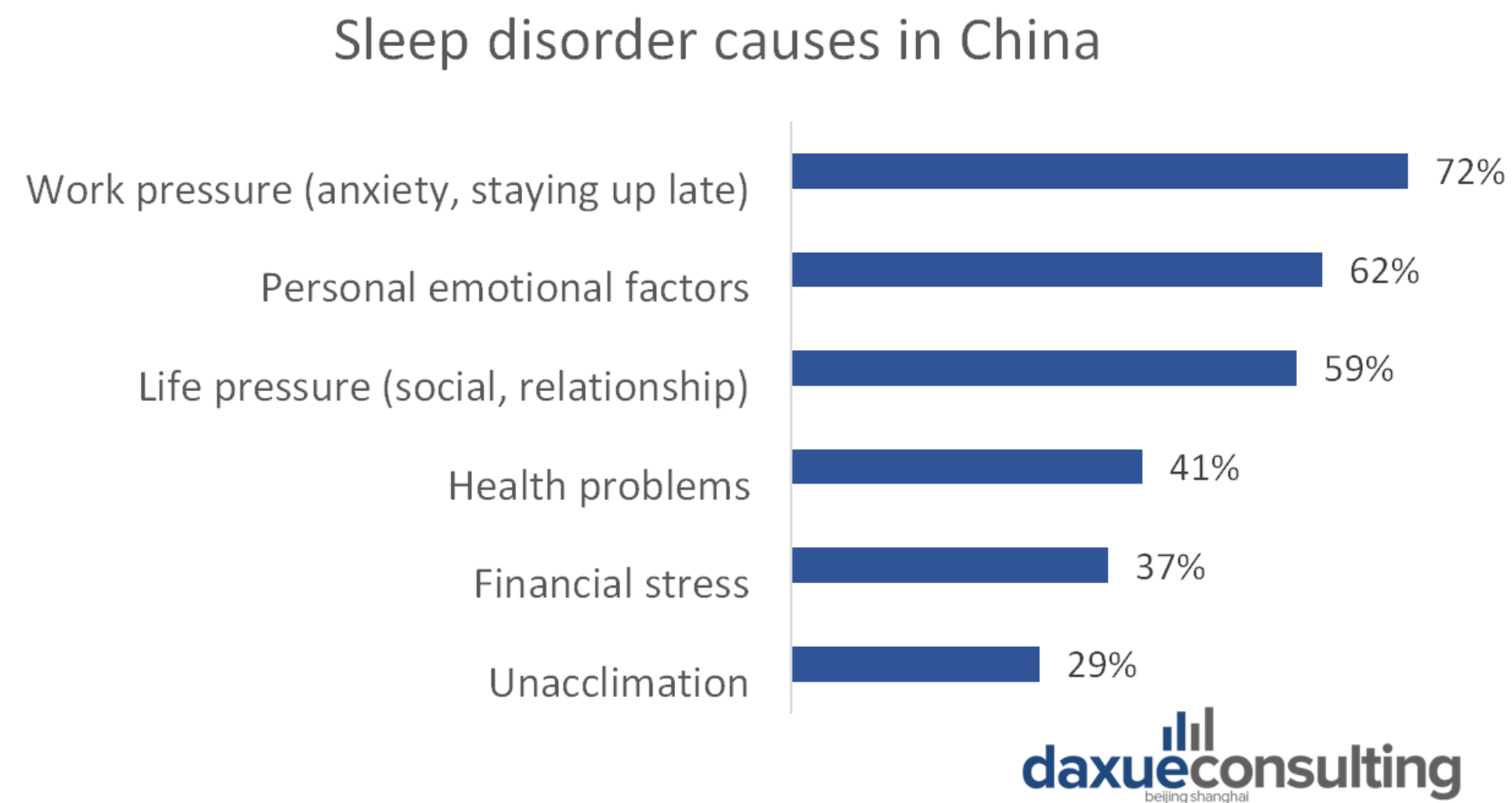
2.7. Market Analysis

The sleep economy in China refers to the economic phenomenon arising from the need for people to get rid of sleep problems. Due to China's fast development speed, nowadays Chinese pays close attention to sleep quality as high-quality rest gets harder to come by; there is an increasing number of people suffering from sleep disorders. Technology provides a solution to such disorders, giving rise to the sleep tech market in China. From 2015-2019, the market size (revenue) of the sleep economy in China raised from 235.36 billion RMB to 359.9 billion RMB, with a CAGR of 11.2%.
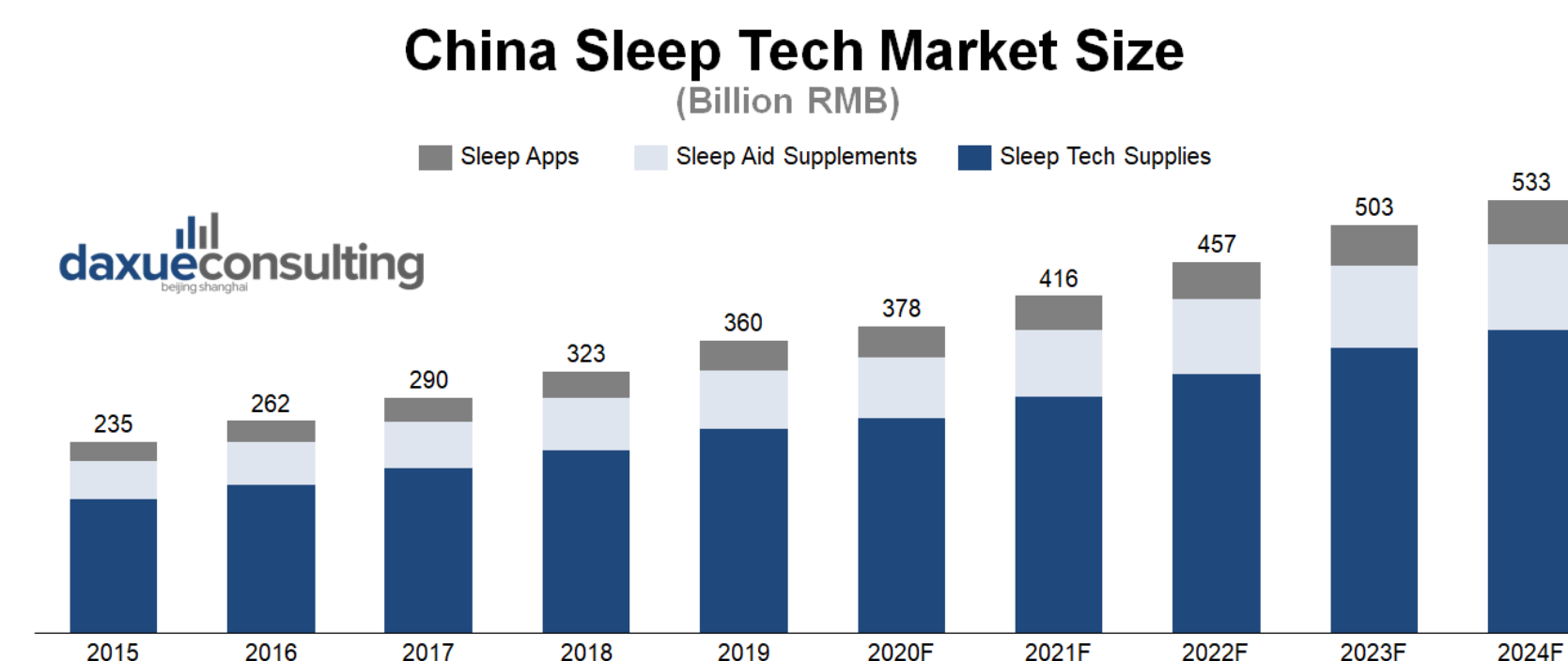
Data source: LeadLeo, designed by daxue consulting, China Sleep Tech Market Size

More than 50% of Chinese have reported having sleep problems. A majority of those who suffer from sleep problems such as insomnia were born since 1990. Culprits to sleep loss are, pressures from work, life, and emotional factors. Sleep disorders that the Chinese usually talk about include drowsiness, insomnia, dizziness, continuous light sleep, etc.

The sleep tech market in China can be categorized into three submarkets: sleep bedding and tech supplies, sleep aid supplements, sleep aid Apps. According to LeadLeo, the sleep tech supplies market contributes the most in the overall market (around 70%), following by sleep aid supplements by 20% and sleep aid apps by 10%. Here is the market breakdown of these three submarkets.

Sleep disorder causes in China

Cause	Percentage
Work pressure (anxiety, staying up late)	72%
Personal emotional factors	62%
Life pressure (social, relationship)	59%
Health problems	41%
Financial stress	37%
Unacclimation	29%

daxueconsulting
beijing shanghai

Figuer 12. JD Big Data, designed by daxue consulting, reasons causing sleep disorders in China

2.7.1. Sleep Tech Devices Market in China

The global technology giants are constantly deploying sleep technology products, which will be the new track with the most development potential. The sleep tech devices market in China continues to grow Smart bracelets, smart health devices, and smart watches are the three most popular types of sleep aid tech products.

When searching for "sleep" related words on Chinese e-commerce platforms, you can find products like white noise sleep aids, sleep aid lamps, music pillows, sleep detection taps, etc. In addition to a wish of a deep sleep, facing frequent business trips and overtime, young people, especially from the new middle class, also wish to have relaxing fragmented rest. The increasing sales of massage chairs, noise-reducing headphones indicates their need to quickly recover from body and brain fatigue.

2.7.2. Sleep-aid Apps in China

There are various sleep aid applications in China. These sleep aid apps offer services such as white noise, ASMR, relaxing music, sleep aid courses, sleep sound audio, etc. Some apps also add functions like sleep monitoring, sleep talk recording, and sleep analysis. According to Qimai data, among the top 30 most downloaded apps on the Chinese iOS app store within a year, there are five sleep tech apps under the health and fitness category.

Summary of sleep tech applications in China

	Rating	Style	Speciality	Monthly Fee
Co Sleep	4.8	comfy	sleep aid audio	30 RMB
Snail Sleep	4.5	sense of tech	sleep talk recorder	12 RMB
Tide	4.9	fresh	white noise	18 RMB

Figuer 13. Zhihu.com, designed by Daxue Consulting, Summary of sleep-aid apps in China
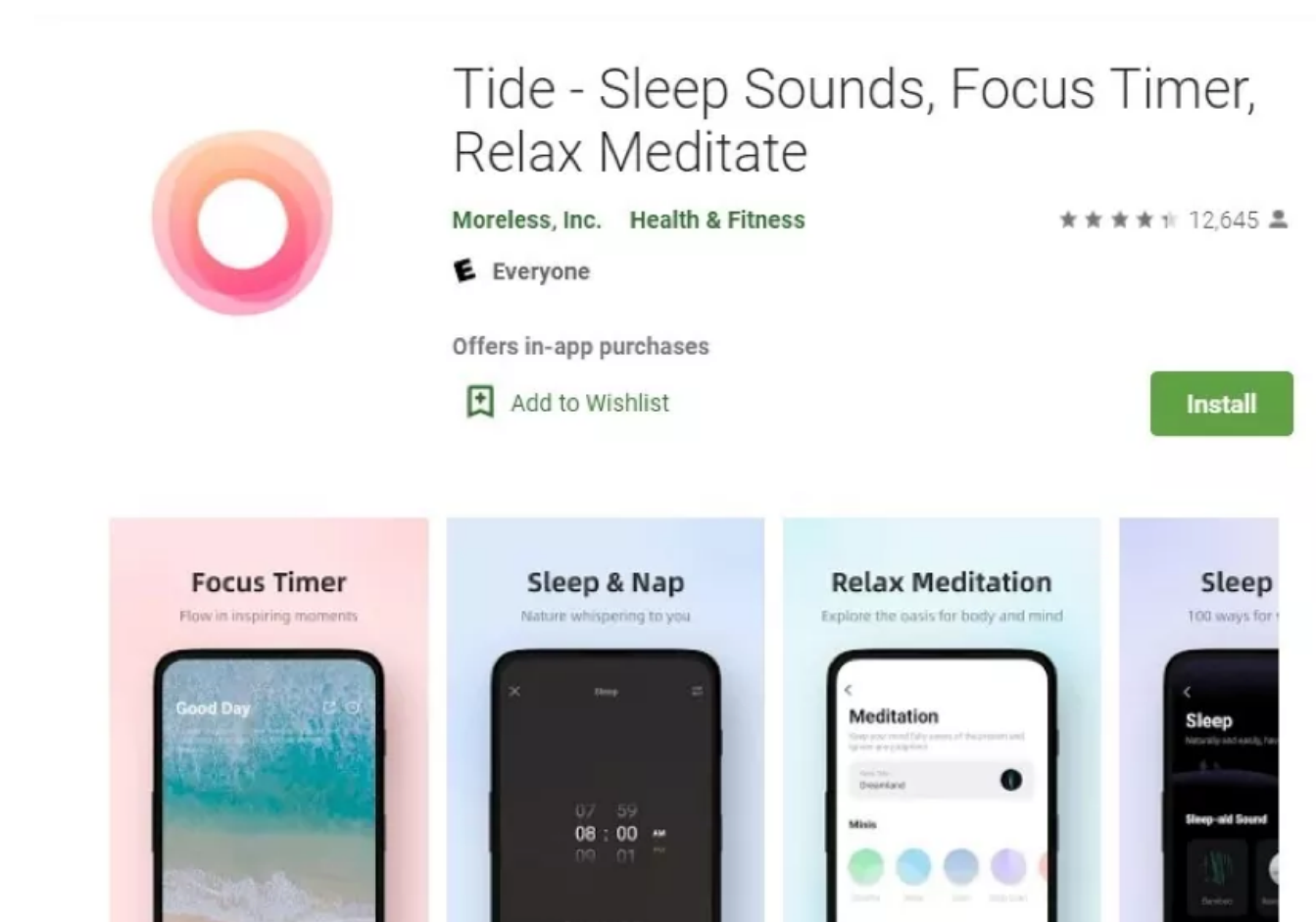
There is no study indicating that sleep apps improve sleep quality, but they monitor sleep activities so users can be aware and make personal corrections. Except for the first two mentioned fitness related apps – Huawei Health and Mi Fit, the leading sleep aid applications includes Snail Sleep (蜗牛睡眠), Co Sleep (小睡眠) and Tide (潮汐). However, such apps often lack adequate means of monetization, and most of them rely on advertising revenue to maintain operations. In addition, the general trend indicates that Chinese consumers demand a transfer from sleep condition monitoring to sleep quality improvement.

Figuer 15. Small Sleep, Data source: apkpure.com
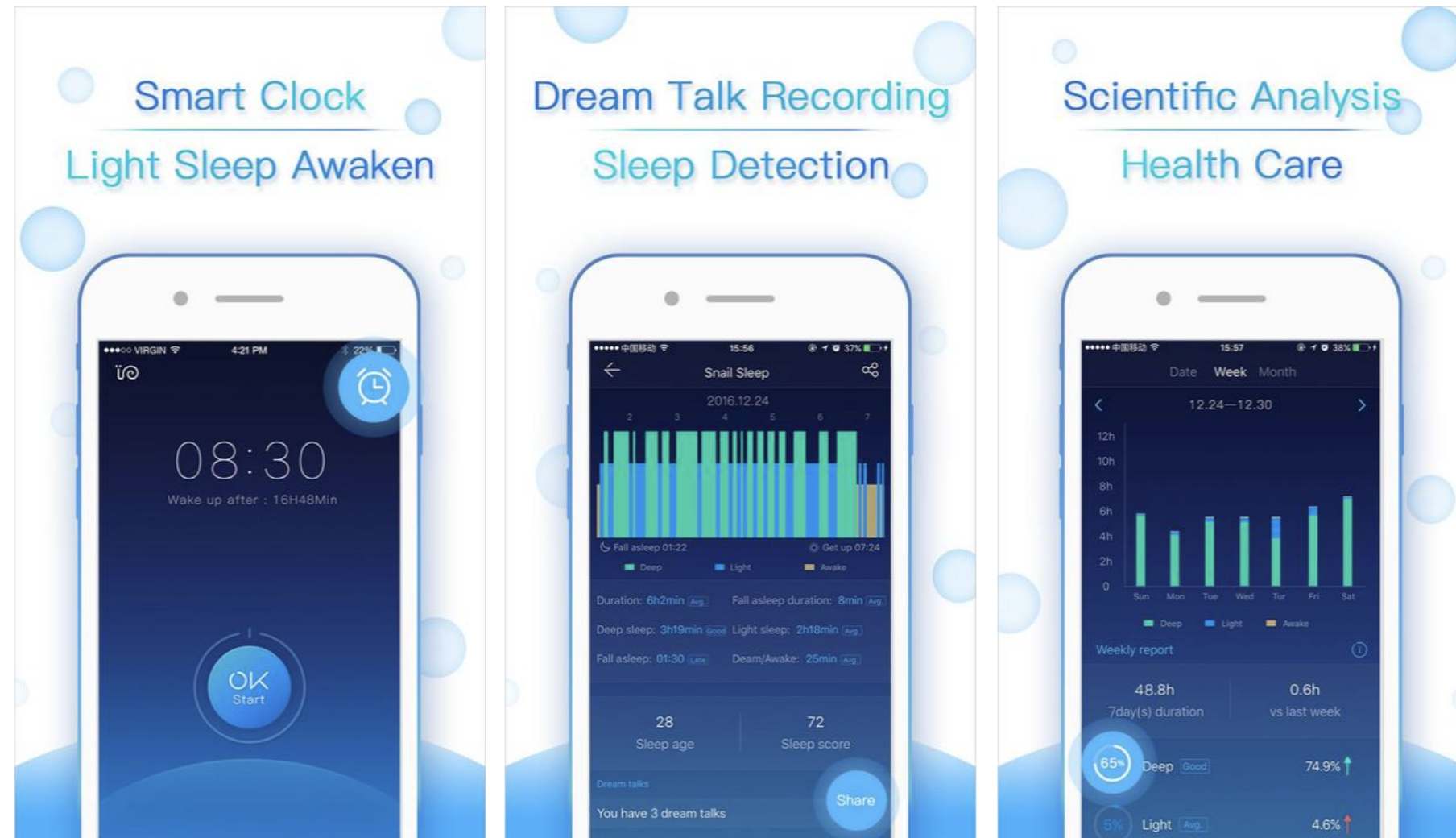
Figuer 14. Snail Sleep, Data source: apkpure.com

Figuer 16. Tide, Data source: adviceforpc.com

2.7.3. Comparison of Sleep-aid apps in China

alarm clock	✓	✓	✓
somniloquy record	✓	✗	✗
Records of sleep	✓	✓	✓
Sleep monitoring	✓	✓	✓
Sleep report	✓	✓	✓
White noise	✓	✓	✓
Night mode switch	✗	✓	✗
Radio music	✗	✓	✗

Community	✓	✓	✗
relax	✓	✓	✓
Meditation	✓	✓	✓
ASMR	✓	✓	✓
mall	✓	✗	✗
Membership system	✓	✗	✓

From this chart, we can see that all of these three apps provided functions of: alarm clock, records of sleep, sleep monitoring, sleep report, relax, meditation, ASMR.

Some special functions which only occurs in one app are: somniloquy record, night mode switch, radio music, mall and membership system.

2.7.4. Target User

From this chart, it can be known that the majority of people suffering from insomnia who use related apps are female users and Genz generation under 24 years old.
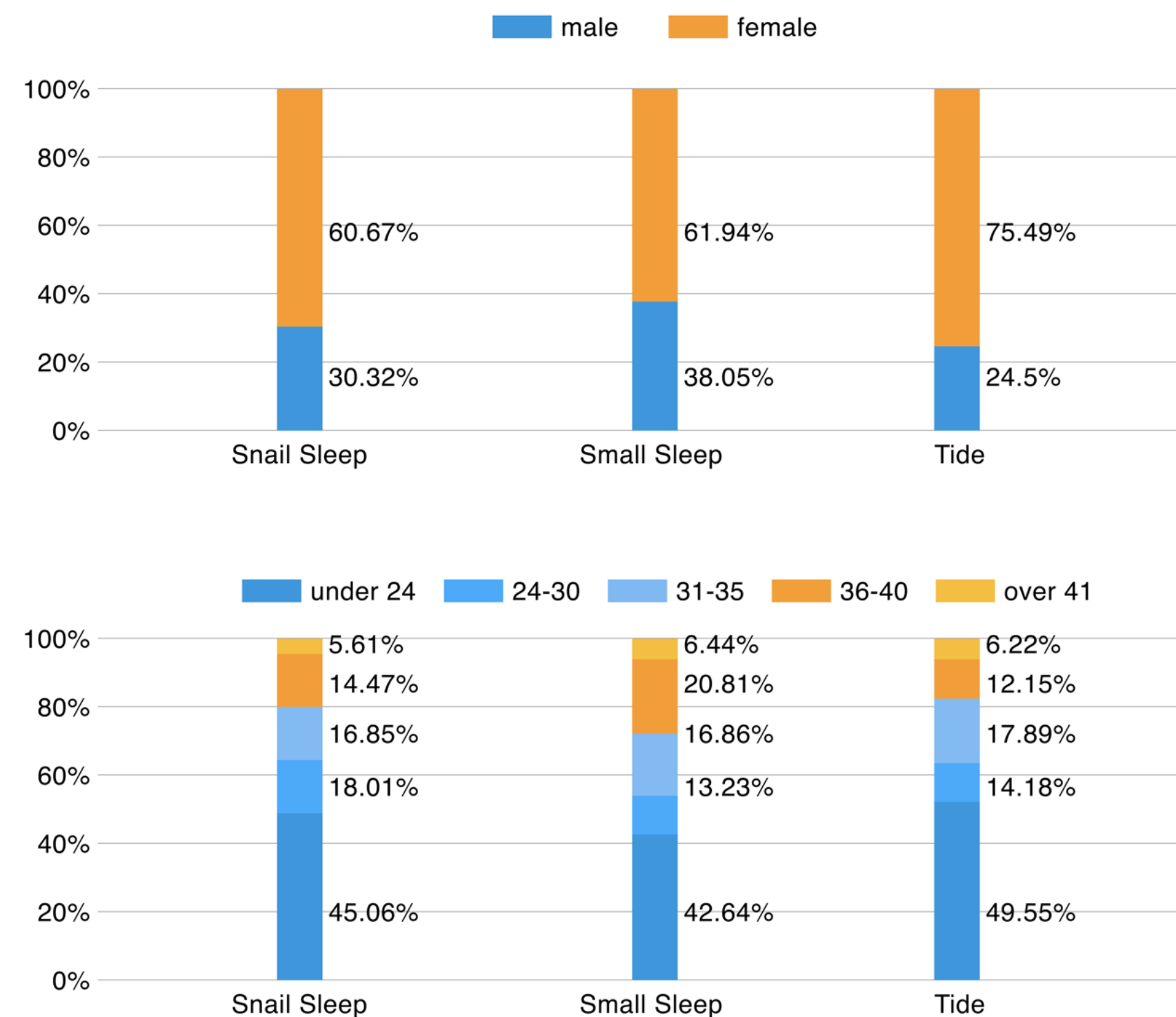
Figuer 14. Snail Sleep, Data source: apkpure.com

2.7.5. Adolescents and Sleep

Adolescence is a time of physical, cognitive, emotional, and social changes, and such changes can have a significant impact on adolescents' sleep patterns and behaviours. Consequently, sleep disorders can also have a significant impact on adolescents' daytime functioning and development (e.g., growth, learning, behaviour, mood, attention, memory, academic performance, etc.). It has been observed that individuals need more sleep during adolescence than during pre-puberty, but adolescents, more often than not, get less sleep than they need (Johnson et al., 2006; Ohayon et al., 2000).

Sleep habits are also observed to change considerably between late adolescence and young adulthood (individuals age 19 to 24) (Ohayon et al., 2000). When Ohayon et al. (2000) compared adolescents' sleep behaviours with those of the young adults in their study, they found adolescents (age 15 to 18) slept earlier, woke up earlier, slept for longer durations, and had less disrupted sleep compared to their young adult counterparts. It was also found that the extra amount of sleep obtained on weekends and days off are more important for adolescents than for young adults (Ohayon et al., 2000), as oversleeping on the weekends (i.e., "catching up" on sleep) appears to buffer the sleep deficit most adolescents accumulate over the

weeknights. Overall, insomnia-like symptoms are the most common sleep symptoms reported by adolescents (Ohayon et al.,2000), and are found to be relatively stable (Patten et al., 2000). However, careful consideration should be taken when trying to differentiate disrupted sleep as either a sleep delay – which can contribute to limited sleep, disrupted sleep patterns, and an increased vulnerability to excessive sleepiness – or insomnia. Unlike insomnia, individuals with delayed sleep patterns have little difficulty maintaining sleep once it is initiated and, although delayed, the sleep is normal.

2.7.6. Takeaways for sleep tech market in China

Healthy sleep is an urgent need for modern Chinese people, which has given birth to the development of the sleep technology market in China.

In China, Consumers demand sleep tech products not simply to monitor sleep activities but to effectively see the improvement of sleep quality. The sleep tech market in China is a new blue ocean for companies because it is still in the initial stage of exploration. There are still obvious shortcomings in different types of products: severe product homogeneity, low entry barriers, chaotic system. As enterprises continue to explore and promote the continuous iteration of products, the pace of development of the sleep economy in China will surely accelerate.

Chapter 3
Methodology

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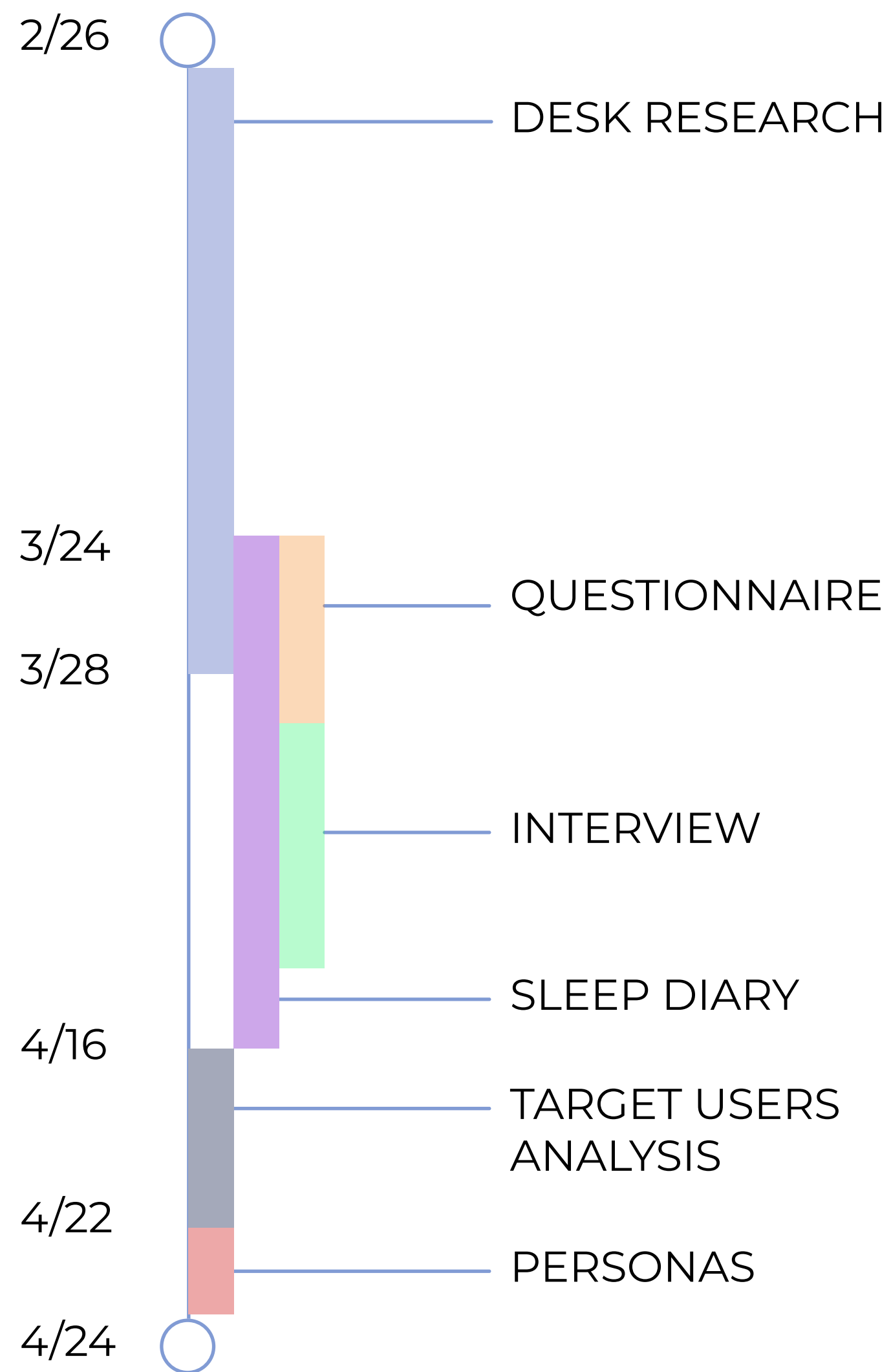
3.1. Design Methodology Overview

Here show the overview and timeline of the whole design methodology. At the beginning of the first stage of this project, I conducted desk research for one month in order to have a comprehensive understanding of all aspects of sleep and insomnia, whose result was shown in the "Literature Review" in the previous section. Then the questionnaire was conducted among 41 users. At the same time, the sleep diary has been recorded according to the instruction. Then I did semi-structured interview with two friends in different professions who both suffered from insomnia to collect more abundant insomnia stories, as well as in-depth understanding of the psychology of insomnia users. After the research, the characteristics of the target population suitable for the treatment of insomnia APP were obtained. Finally, I summed up a personas, which provides the conclusion of pain points and needs for later design phase.

3.2. Questionnaire

1. Please rate the current (i.e. last 2 weeks) SEVERITY of your insomnia problems

Difficulty falling asleep*

	0	1	2	3	4	
none	○	○	○	○	○	very

Difficulty staying asleep*

	0	1	2	3	4	
none	○	○	○	○	○	very

Problem waking up too early*

	0	1	2	3	4	
none	○	○	○	○	○	very

2. How satisfied/dissatisfied are you with your current sleep pattern?

	0	1	2	3	4	
very satisfied	○	○	○	○	○	very dissatisfied

3. To what extent do you consider your sleep problem to INTERFERE with your daily functioning (eg. daytime fatigue, ability to function at work/daily chores, concentration, memory, mood, etc)

	0	1	2	3	4	
not at all interfering	○	○	○	○	○	very interfering

4. How NOTICEABLE to others do you think
your sleeping problem is interms of impairing
the quality of your life?

0   1   2   3   4
not at all noticeable ○ ○ ○ ○ ○ very noticeable

This questionnaire was filled by 41 young people who under 24 years old, and here is the result. From the result chart we can know that More people regard their sleep quality as fluctuating around the average, and fewer saw their sleep as extremes of good and terrible. According to the satisfaction level of their sleeping quality, over 65% of them chose level 3 and level 4 which is an above average level of dissatisfaction. Presumably, most people still want to improve their sleep quality, so they are not satisfied with their current situation, and most of them expressed some level of anxiety and worry about their sleep.

5. How WORRIED/ disteressed are your current
sleep problems?

0   1   2   3   4
not at all ○ ○ ○ ○ ○ very much

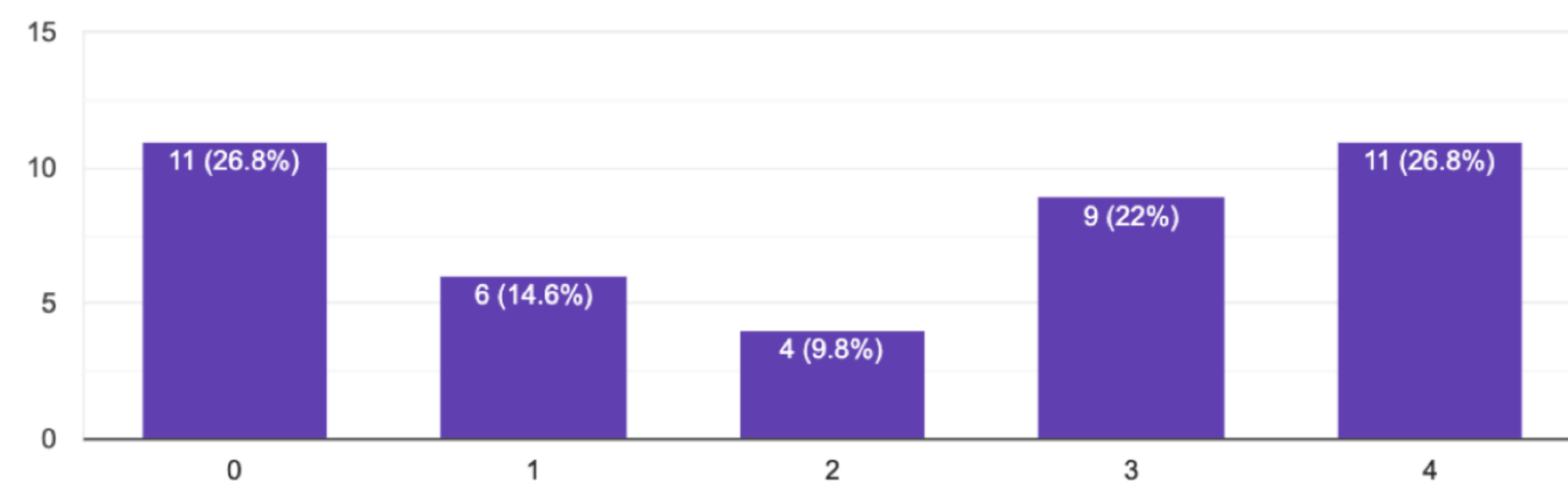**1. Please rate the current (i.e. last 2 weeks) SEVERITY of your insomnia problems**

Difficulty falling asleep
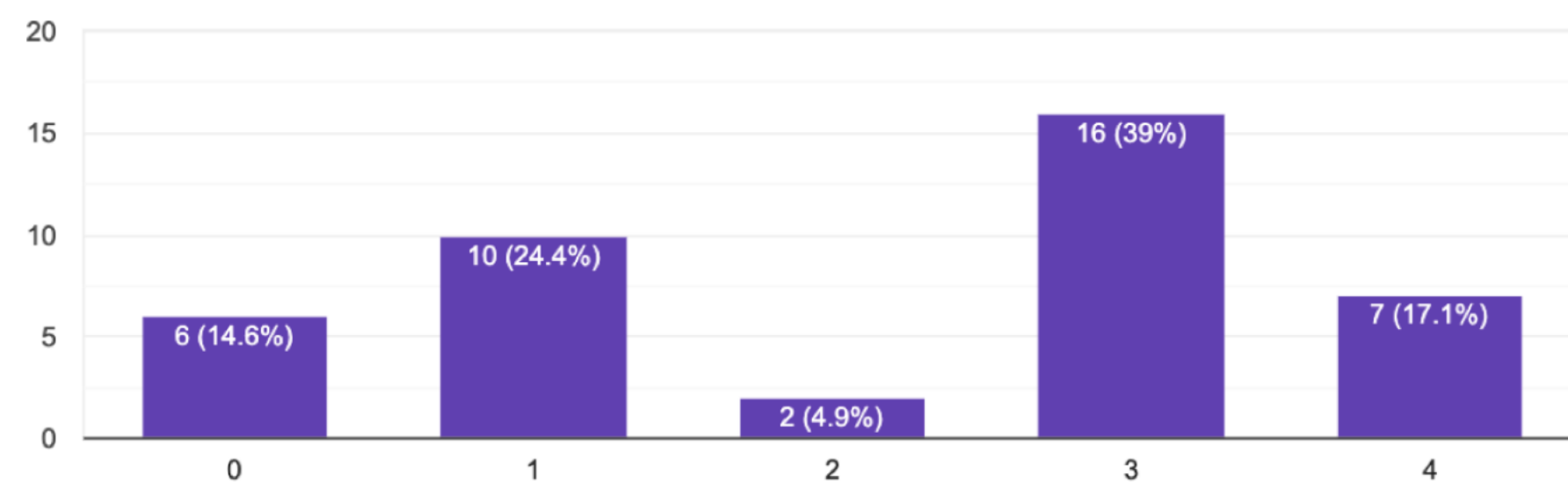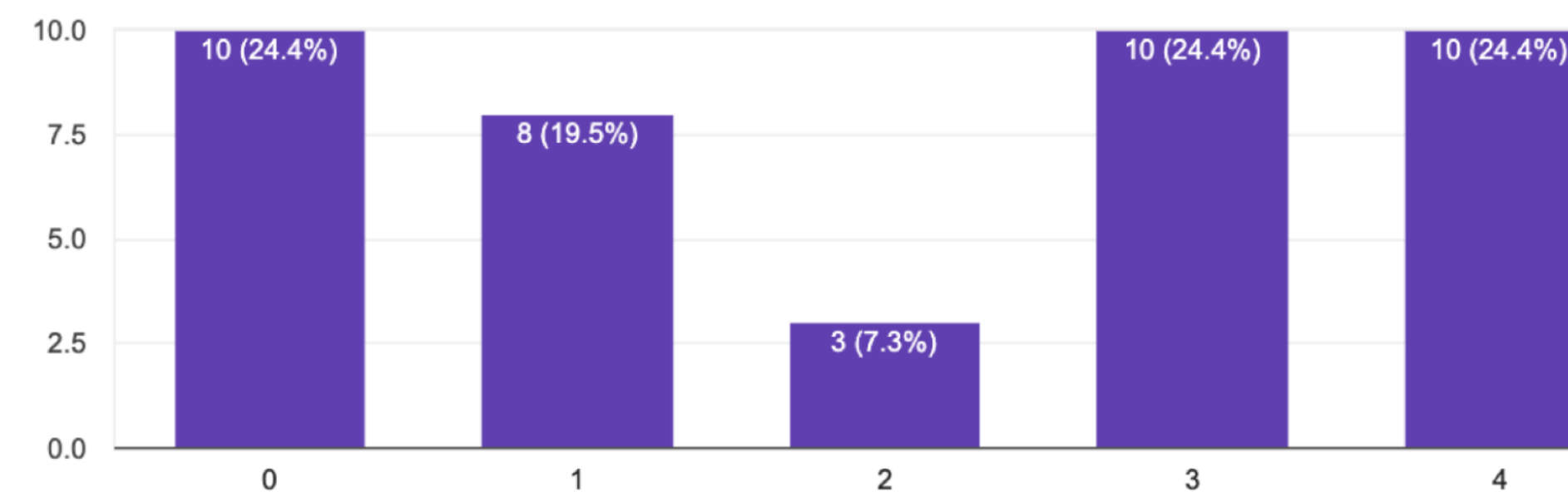
(41 条回复)

Difficulty staying asleep

(41 条回复)

Problem waking up too early

(41 条回复)

2. How SATISFIED / dissatisfied are you with your current sleep pattern?

(41 条回复)
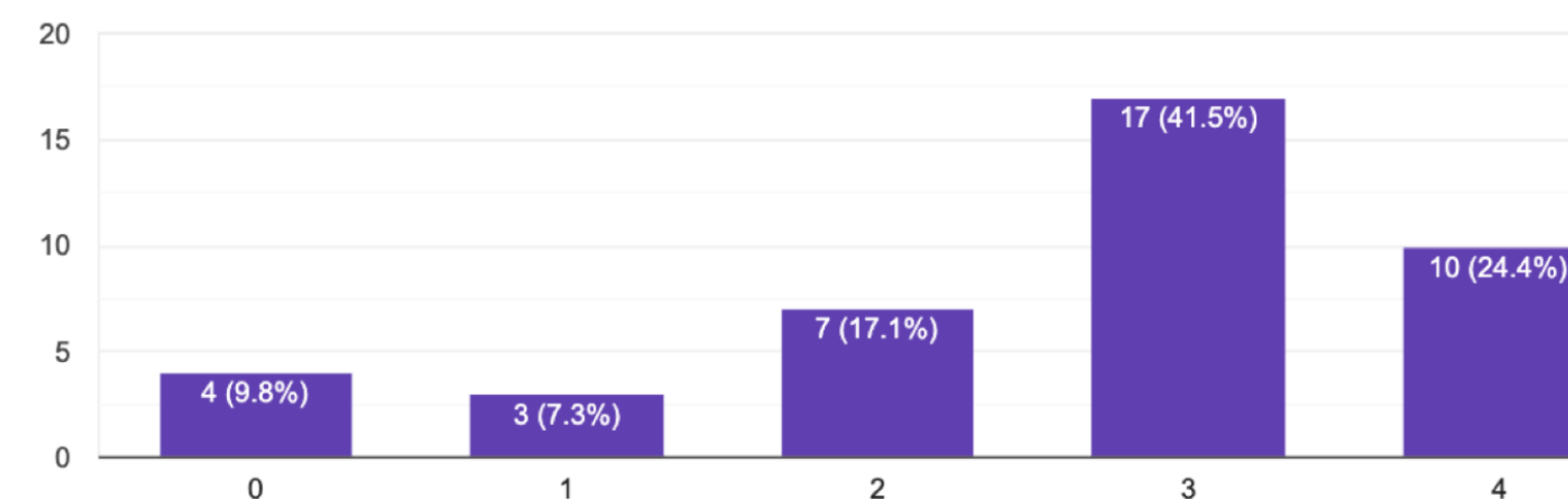
3. To what extent do you consider your sleep problem to INTERFERE with your daily functioning(eg. daytime fatigue, ability to function at work/daily chores, concentration, memory, mood, etc)

（41 条回复）

4. How NOTICEABLE to others do you think your sleeping problem is interms of impairing the quality of your life?

（41 条回复）

5. How WORRIED / disteressed are you about your current sleep problem?

（41 条回复）
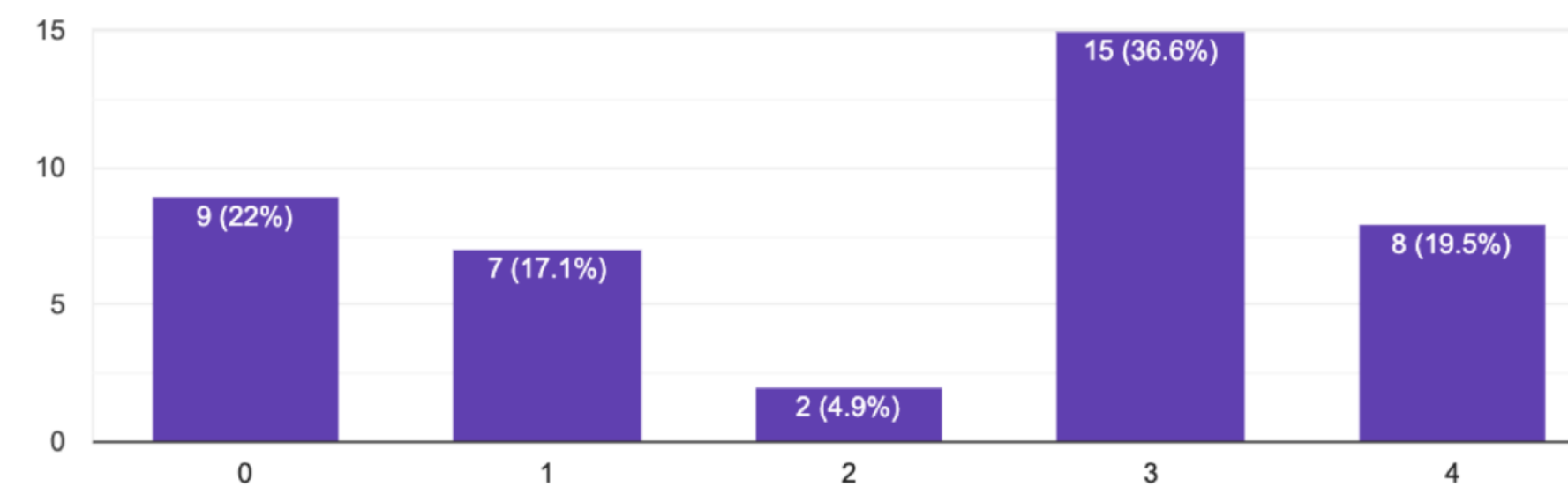
3.3. Interview

Jie Wang, 22, student

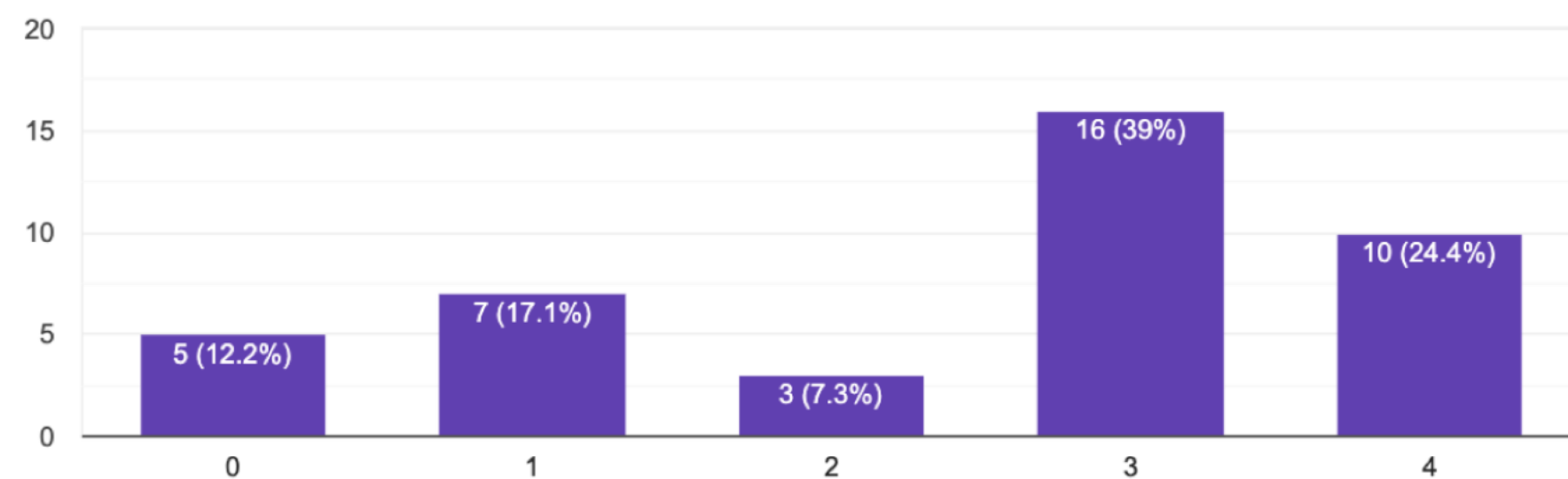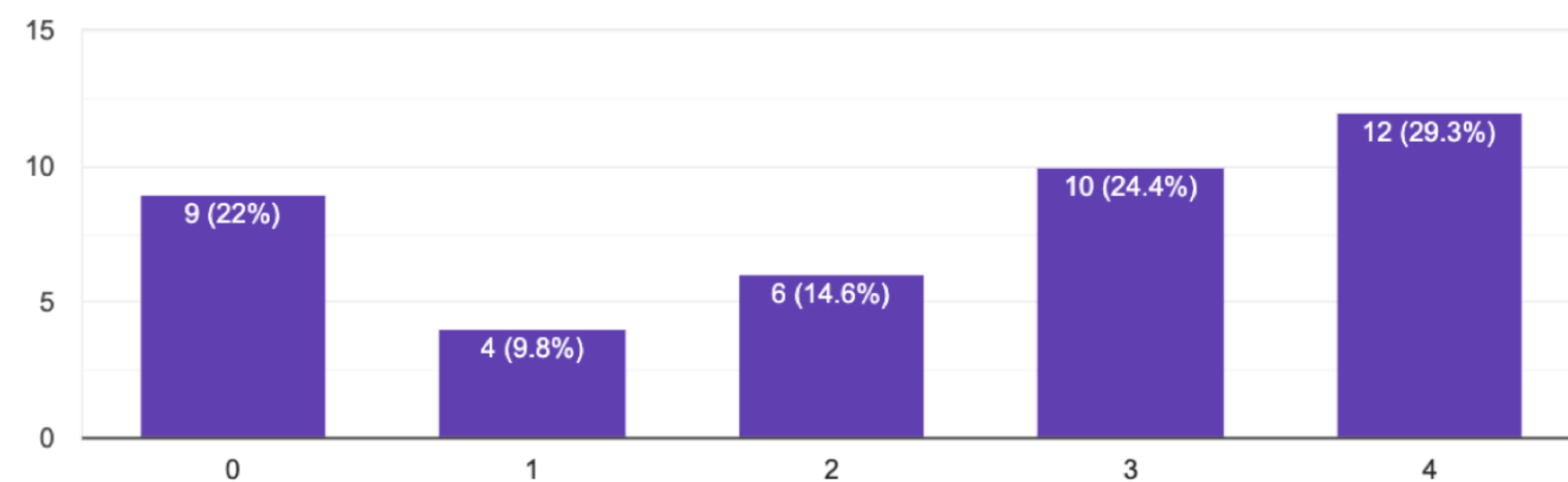**What time did you go to bed these two weeks ?**

Over 1 am. One day I couldn't sleep until 6 am.

How long has this been going on?

Two months. I used to sleep pretty well.

What do you think is the reason of your insomnia?

Since I am about to graduate, I have been thinking about job–hunting recently, and I have some **pressure on my career**. There was no reply to my resume, and I was so anxious that I couldn't sleep.

What do you do when you can't sleep ?

I search the Internet for job search advice and read posts about other people's experiences and progress. But sometimes it makes me more anxious. Sometimes, I just simply **listen to the music, but it makes me sadder**.

Siji Li, 24, designer

What time did you go to bed these two weeks ?

Over 2 am. Because I'm so busy with work, I always get off work at 12pm. And it's not easy for me to fall asleep immediately.

How long has this been going on?

I have been in this company for one year, because I cherish this job opportunity very much, and I need to perform well in my work to compete for the opportunity of promotion.

What do you do when you can't sleep ?

I take some supplements, like melatonin, I need to keep working well the next day.

What do you think is the reason of your insomnia?

I think it is my busy state that makes my living habits irregular. Drinking a lot of coffee regularly, having no time for exercise, having unstable meals, etc.

Then I did semi-structured interview with two friends in different professions who both suffered from insomnia.
Siji Li, who is a 24-year-old designer in a big company, always leaves company at around 12 pm. The high intensity of her job forced her to stay up late washing and getting ready for sleep. Even though she knows she should go to sleep right away because she needs to get up early and have the energy to work the next day, it often takes her an hour or more to get to sleep. She couldn't find a good way to deal with the problem and resorted to forced sleep intervention with drugs such as melatonin. She has had this problem for nearly a year, because she has been working at the company for a year. She cherished this job opportunity very much, and she thought she needed to perform well in my work to compete for the opportunity of promotion.

Jie Wang, who was a 22-year-old student, can be called the routine of an evening sleeper. He always sleeps over 1am, sometimes even can't sleep even when the sun comes up. This situation has been keeping on for two months, since he is about to graduate, he has been thinking about job-hunting recently, and he has some pressure on his career. There was no reply to his resume, and he was so anxious that I couldn't sleep. Additionally, when he cannot fall asleep, he will search the Internet for job search advice and read posts about other people's experiences and progress. But sometimes it makes him more anxious. Sometimes, he just simply listened to the music, but it makes him sadder. A special word "网抑云" often used to describe a group of young Chinese who are listening to sad music late at night, and then becoming more depressed and resentful.

3.4. Sleep Diary

A sleep diary is a daily record of important sleep-related information. Although not all sleep diaries are identical, they commonly include details about:

- Bedtime and/or lights-out time
- Wake-up time
- How long it takes to fall asleep
- The number and duration of sleep interruptions
- The number and duration of daytime naps
- Perceived sleep quality
- Consumption of alcohol, caffeine, and/or tobacco
- Daily medications
- Daily exercise

Sleep diaries are also called sleep journals or sleep logs. These terms are typically used interchangeably, although some consider a sleep diary to be more detailed than a sleep log. Regardless of the name, all of these are patient-recorded methods of tracking information about sleep.

Identifying details about habits that affect sleep can show patterns that help explain sleeping problems. For healthcare providers, the concrete entries in a sleep diary are often more reliable and usable than a general recollection about sleep habits.

Another way that a sleep diary is used is in preparation for certain specialized sleep studies. A sleep diary can enhance the validity4 of sleep tests by showing that a person's sleep is stable in the lead-up to the study.

Here is the sleep diary form settled for users.

Morning							
	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Day of week:							
What time did you get into bed?	PM AM	PM AM	PM AM	PM AM	PM AM	PM AM	PM AM
What time did you try and go to sleep?	AM PM	AM PM	AM PM	AM PM	AM PM	AM PM	AM PM
How long did it take you to fall asleep?							
What time did you wake up this morning?	AM PM	AM PM	AM PM	AM PM	AM PM	AM PM	AM PM
How many times did you wake up during the night?							
No. of times							
No. of minutes							
Last night I slept a total of:							
How would you rate your sleep quality?							
Very Poor	○	○	○	○	○	○	○
Poor	○	○	○	○	○	○	○
Fair	○	○	○	○	○	○	○
Good	○	○	○	○	○	○	○
Very Good	○	○	○	○	○	○	○
Was your sleep disturbed by any factors? If so, list them here (ex. allergies, noise, pets, discomfort/pain, etc.)							
Any other comments about your sleep worth noting?							

Evening							
	Day 1	Day 2	Day 3	Day 4	Day 5	Day6	Day 7
Day of week:							
I consumed caffeine in the: (AM) morning, (PM) afternoon/evening, (LN) late night, (NA)							
AM, PM, LN, NA							
How many?							
How much exercise did you get today?							
No. of minute s							
Time of day AM, PM, LN, NA							
Did you take a nap? (c heck one)	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No
If yes, for how long?							
List all medications, vitamins, and supplements you took today							
Approximately 2-3 hours before getting to bed, I consumed:							
Alcohol	◯	◯	◯	◯	◯	◯	◯
1+ glasses of water, juice, milk, etc.	◯	◯	◯	◯	◯	◯	◯
A heavy meal	◯	◯	◯	◯	◯	◯	◯
Caffeine	◯	◯	◯	◯	◯	◯	◯
NA	◯	◯	◯	◯	◯	◯	◯
My nighttime routine included: (ex. taking a bath/shower, stretching, reading a book/ magazine, using mobile devices or a computer)							

Sleep Diary Directions:

- Please fill out this sleep diary every day.
- Don't worry about the exact times, just give your best estimation.
- For areas like fatigue and number/length of naps, please fill these areas out within 1 hour of going to bed if possible.
- It is okay if you forget to fill out those areas before falling asleep, just try your best to remember them when you fill it out in the morning.
- For the other areas, please fill them out within 1 hour of waking up in the morning.
- Please bring the completed form back with to the second session.

The following tell you what is being asked for each item:

• Time to bed: Approximate time you went to bed to attempt to fall asleep.
• Time out of bed: The time you woke up and did not try to fall back asleep.
• Sleep latency: How long you think it took for you to fall asleep (does not have to be 100% accurate, just give your best estimation).
• Number of awakenings: How many times you woke up during the night.
• Time out of bed during awakenings: Estimated time out of bed before returning to fall asleep.
• Naps number/time: The total number of naps you've taken within the given day and how long they were.
• Sleep quality: Rate your sleep the previous night on a 0-4 scale with 0 being very poor sleep and 4 being very good sleep.
• Fatigue: Rate your levels of fatigue during the day on a 0-4 scale with 0 being no fatigue and 4 being very fatigued.
• Two chronic insomniacs between the ages of 20 and 24 were asked to use an insomnia journal to record their daily sleep status

3.5. Target User Types

1. People who suffer from insomnia and need assisted sleep
People who feel difficult to fall asleep and the quality of sleep is poor for a long time. I hope to customize a reasonable sleep program and sleep AIDS for myself through effective means to help myself fall asleep quickly or improve the quality of sleep.

2. Chronic anxiety, energy exhaustion of high-pressure people
Their social life pressure, emotion cannot be a good solution, resulting in poor sleep quality, sleep is relatively shallow, after sleep is still relatively nervous, easy to be awakened, need to use external means to relieve the emotion, relieve pressure.

3. Understand their sleep efficiency, pay attention to the quality of life, want to improve sleep
They generally don't have much difficulty falling asleep, but they hope to improve their quality of life by analyzing their own quality of life with the help of professional sleep-aid apps.

3.6. Personas

AGE: 22 years

CITY: Shanghai, China

OCCUPATION: Student

LIVING: Living alone

"When I go to bed at night, I get a little anxious, thinking I'm going to be too late, while I will not feel sleepy at all."

▌ Painpoints

- Can't assess sleep level accurately
- Both the duration and quality of sleep need to be improved
- Anxiety in bed needs to be improved

▌ Wants & Need

- Would like to have a clearer and more objective understanding of her sleep condition.
- Hope I can reduce the anxiety before sleep and fall asleep quickly in a relaxed mood.
- Hope to improve my sleep quality while ensuring a long sleep time.
- Want to learn more knowledge about insomnia.

Chapter 4
Design Phase

4.1. Wireframe

QUESTIONNAIRE

HOME

GOOD NIGHT
xxx

THERAPY

MOMENT

PROFILE

SLEEP GOAL

sleep goal

SET YOUR SLEEP GOAL
7H 30MIN

SLEEP TRACK

sleep tracking

AVR SLEEP DURATION
7H 30MIN

Monday, 30 July
7H 16
(00:32-7:48)

00:00   8:00

SLEEP TIPS

sleep tips

MUSIC MODE

music mode

0:00   3:40

YOGA THERAPY

yoga courses

CBT-I THERAPY

CBT-I therapy

Sleep efficiency
82.3%

Total sleep time :   7H
Time in bed :   8.3h

Monday, 30 July
7H 16
(00:32-7:48)

00:00   8:00

CONSULTANT

consultant

MAGIC MATCH

magic match

4.2. Moodboard

4.3. LOGO

Sweat sleep

The name of this APP is "Sweat Sleep", which mainly placed expectations that users can sleep soundly and keep happy mood, which is as sweat as eating candies.

The main color of this logo and also the whole app design is green. The color green is an excellent color choice for relaxation, and it's an easy color for the eyes to see because they are sensitive to green light. A green room helps us feel calm and peaceful because green is a non-stimulating color. In addition, green is an organic color that reminds us of nature. People also reported waking up feeling upbeat and positive.

The selected colors and smooth and soft text lines are designed to make users feel more cordial and relaxed, and feel closer to nature.

4.4. Hi-fi Interface Display
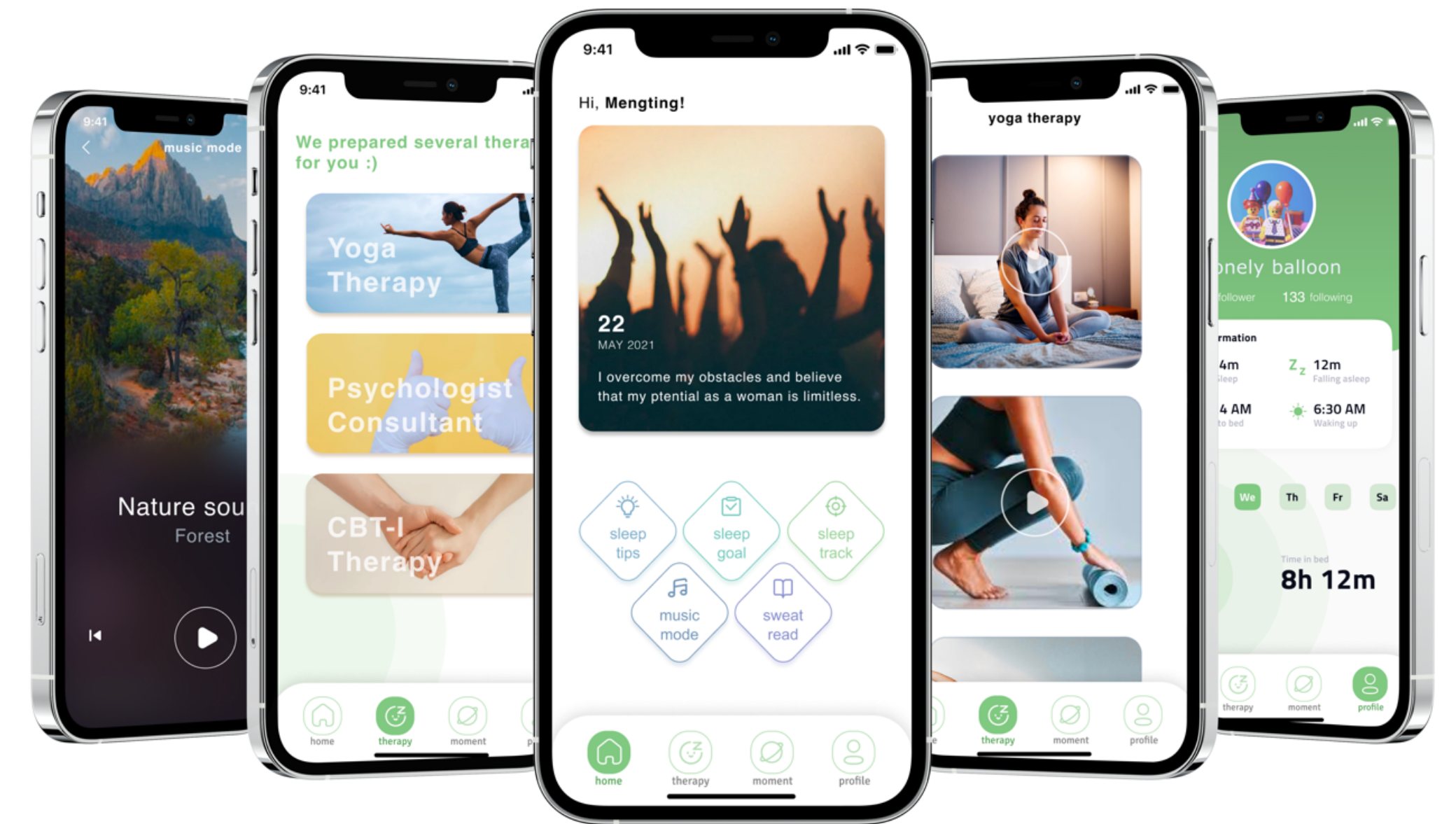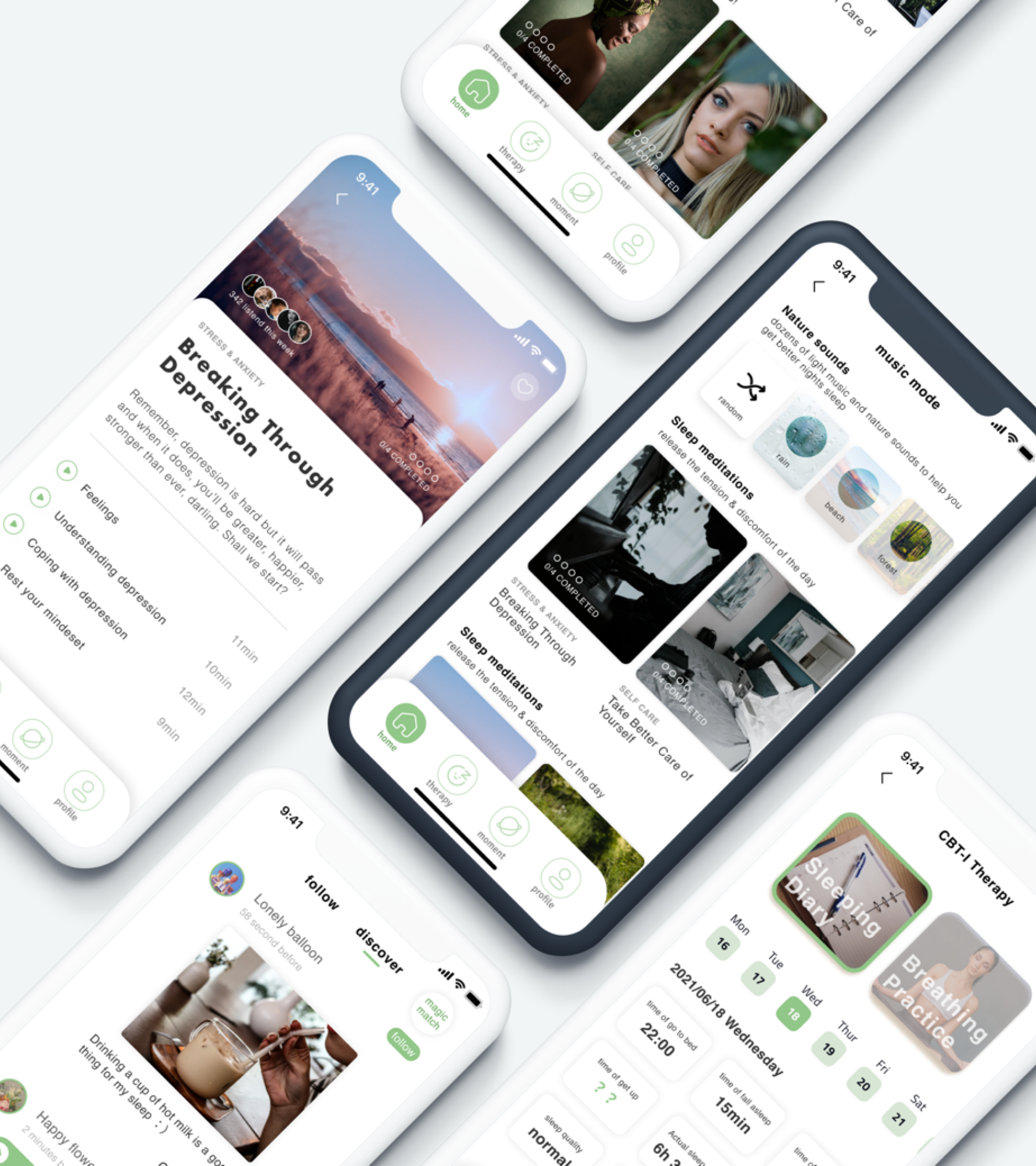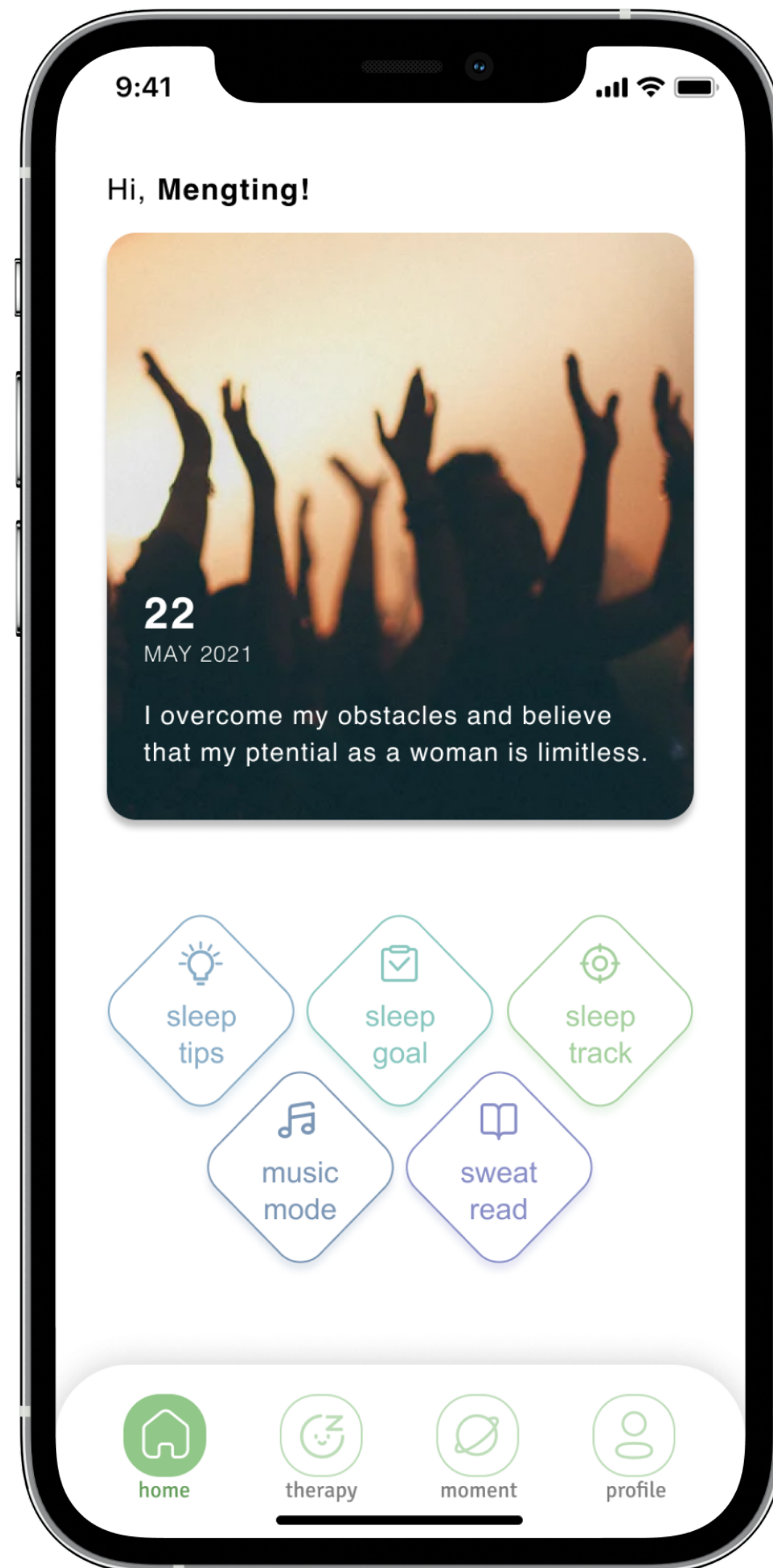
4.4.1. Home

The home page is the first interface the user sees after entering the software. This function module is designed mainly as a module to provide some sleep tips and help the user develop good sleep habits.

In the design of the homepage function, first of all, we hope to provide users with a kind of cordial feeling, so that the first impression of users using this software is pleasant. Therefore, at the top part of this interface, there will be some inspiring pictures and sentences at random, and will greet the user kindly as well in order to shorten the distance between users.

Then, in order to help users develop good sleep habits, it provided five small functions : sleep tips, sleep goal, sleep track, music mode and sweat read.

sleep tips

Good sleep habbit

STRESS & ANXIETY
Breaking Through Depression

0/4 COMPLETED

SELF CARE
Take Better Care of Yourself

0/4 COMPLETED

Comfortable sleep environment

STRESS & ANXIETY
Breaking Through Depression

0/4 COMPLETED

SELF CARE
Take Better Care of Yourself

0/4 COMPLETED

home   therapy   moment   profile

342 listend this week

0/4 COMPLETED

STRESS & ANXIETY

Breaking Through Depression

Remember, depression is hard but it will pass and when it does, you'll be greater, happier, stronger than ever, darling. Shall we start?

Feelings   11min

Understanding depression   10min

Coping with depression   12min

Rest your mindeset   9min

home   therapy   moment   profile

sweat read

Feelings

Breaking Through Depression

sleep tips

The module of sleep tips mainly provides some tips to help people develop good sleep habits, as well as popular science related sleep knowledge.

When users entering the sleep tips module, the content will be devided into several parts : good sleep habbit, comfortable sleep environment, specific foods that can affect sleep and so on.

The difference design part is that, all the sleep tips will be in the form of voice playback rather than text reading. Tempting as it might be to use your computer or phone before bed, studies have shown these devices can interfere with sleep by suppressing the production of melatonin, a natural hormone released in the evening to help you feel tired and ready for sleep. This leads to neurophysiologic arousals that increase feelings of alertness when you should be winding down instead. Therefore, it's better to prevent users from looking at the phone screen too much before going to bed.

10 TIPS FOR BETTER SLEEP

WORLD SLEEP SOCIETY
Advancing Sleep Health Worldwide

10. Reserve your bed for sleep and sex, avoiding its use for work or general recreation.

1. Establish a regular bedtime and waking time.

2. Allow yourself to take a nap if you're tired.

3. Adjust to a healthier lifestyle regarding your substance use.

4. Create a caffeine cut-off time.

5. Change up your bedtime snack.

6. Watch your workout routine.

7. Use comfortable, inviting bedding.

8. Find a comfortable sleep temperature setting and keep the room well ventilated.

9. Block out all distracting noise and eliminate as much light as possible.

good sleep habbit

Maintain a regular sleep schedule. Attempt to wake up in the morning and go to bed at the same time every day, even on weekends.

Avoid alcohol, caffeine, and nicotine. Caffeine, nicotine and other stimulants too close to bedtime can prevent you from falling or staying asleep.

Don't eat too late. Also, avoid large meals too close to going to bed. Your last meal should be eaten at least 3 to 4 hours prior to bedtime.

Be comfortable. Wear comfortable clothes that are loose and feel soft to touch. Have comfortable bedding as well. Maintain a comfortable temperature in your room. Make sure your pillows adequately support your head.

Avoid naps. Napping too much during the day or too close to your bedtime can interfere with your nighttime sleep. If needed, limit naps to 30 minutes.

Avoid engaging in stressful activities before going to sleep. Instead, create a wind-down routine. Calming exercises such as meditation can relax the mind.

Ensure your room is dark and free from distracting noises. Turn off the TV or computer screen to block out unnecessary light.

Exercise regularly.

Check your medications. See if any of the medications that you take may be affecting your sleep. Some over-the-counter and prescription medications may contain stimulants or have side effects such as nervousness or jitteriness or increased urination. If you need to take medications that can interfere with sleep, speak with your healthcare professional about taking it in the morning or earlier in the day.

See a doctor if you have trouble falling asleep most nights and feel tired after sleeping what you think is an adequate amount of time. Sleep disorders like sleep apnea or narcolepsy may need more specialized medical attention.

comfortable sleep environment

A relaxing environment is essential for a good night's rest. Studies have shown people simply sleep better when their bedroom is optimized for light and noise levels, temperature, and comfort. And since sleep quality and duration are directly tied to other aspects of human health, a bedroom environment that promotes sleep can also improve how you feel while you're awake.

Best of all, creating the ideal bedroom doesn't need to break the bank. There are several cost-effective ways to make your sleep space more soothing and suited for rest.

Important Elements of a Relaxing Bedroom:

1. Temperature

Some people run hot in bed while others sleep somewhat cool. However, any healthy adult will experience a drop in body temperature while they sleep. This naturally occurs during the initial stages of your sleep cycle because a lower core temperature makes you feel sleepy, whereas a higher temperature helps you stay alert during the day.

Whether you only use a top sheet or sleep beneath a thick comforter, many experts agree the ideal bedroom temperature for sleeping is 65 degrees Fahrenheit (18.3 degrees Celsius). This might sound a bit chilly for some, but a cooler thermostat setting helps you maintain a lower core temperature while you sleep.

That said, 65 degrees may not be the best temperature for everyone. A range of 60 to 71.6 degrees Fahrenheit (15.6 to 22.0 degrees Celsius) should be suitable for most sleepers. If you still find these settings too cold, try adding a layer or two to your bedding. If you're too warm or the weather is particularly hot or humid, consider removing a layer or wearing lighter bedclothes in order to stay cool in bed.

2. Noise
It should come as no surprise that a quieter bedroom is better for sleep than a louder one. Loud noise disturbances3 can cause severe sleep fragmentation and disruption, which in turn can have negative impacts on your physical and mental health. Research even suggests that noise at low levels can cause you to shift to a lighter sleep stage or wake up momentarily.

3. Light

The circadian rhythms that guide your sleep-wake cycle are heavily influenced by natural light and darkness. During the day, your eyes perceive sunlight and signal the brain to produce cortisol, a hormone that helps you stay alert and energized. At night when darkness falls, your brain then produces another hormone, melatonin, to induce feelings of sleepiness and relaxation.

Exposure to artificial light in the evening can delay circadian rhythms and prolong sleep onset5, or the time it takes you to fall asleep. Light intensity is measured in units known as lux. Studies have found that exposure to light sources with a lux of 10 or higher later in the day can lead to more nocturnal awakenings and less slow-wave sleep, a portion of your sleep cycle that is vital to cell repair and bodily restoration. Smartphones, televisions, and other devices with screens6 also produce artificial blue light that can be detrimental to sleep, even if you use dimmer "nighttime" screen settings.

Keep your bedroom light levels as low as possible if you like to read in bed before sleep. Dimmer lights will help you fall asleep more easily. Another good rule-of-thumb is to avoid using screen devices – including televisions – in your bedroom.

4. Mattress and Bedding

Depending on your sleep preferences, you may enjoy the close body contour of memory foam, the gentle support of latex, or the springy feel of a mattress with coils. Some studies have found that a newer mattress7 will promote better sleep quality and alleviate more back pain than an older model. However, the most comfortable mattress for you likely depends on individual factors like body weight, normal sleep position, and whether you prefer lying on a soft or firm surface.

You should also choose your bedding items based on personal criteria. Important considerations for selecting a pillow include firmness, loft (thickness), and durability. For sheets, the best option for you may come down to whether you prefer a crisp or silky hand-feel and how hot you sleep at night.

A sanitary bedroom is also important for promoting healthy sleep. Vacuuming your carpet and regularly washing your bedding can reduce the presence of dust mites8, small arthropods that trigger allergies. Just be sure to follow washing and drying instructions on your bedding's care tags to avoid damage or excessive shrinkage.

specific foods that can affect sleep

Researchers, including nutritionists and sleep experts, have conducted different types of studies to try to discover the best foods for sleep. While this research provides important clues, it's not conclusive. In general, there's a lack of direct evidence about specific foods that are good for sleep.

In addition, the range of varieties of cultivars of most foods means that their nutrient profile can be inconsistent. For example, some varieties of red grapes1 have high levels of melatonin while others have virtually none. Climate and growing conditions may further alter the nutrients in any particular food product.

That said, there are indications that certain foods can make you sleepy or promote better sleep. Sometimes this is based on a particular research study and in other cases on the underlying nutritional components of the food or drink2.

Dietary choices affect more than just energy and sleepiness; they can play a major role in things like weight, cardiovascular health, and blood sugar levels just to name a few. For that reason, it's best to consult with a doctor or dietician before making significant changes to your daily diet. Doing so helps ensure that your food choices support not just your sleep but all of your other health priorities as well.
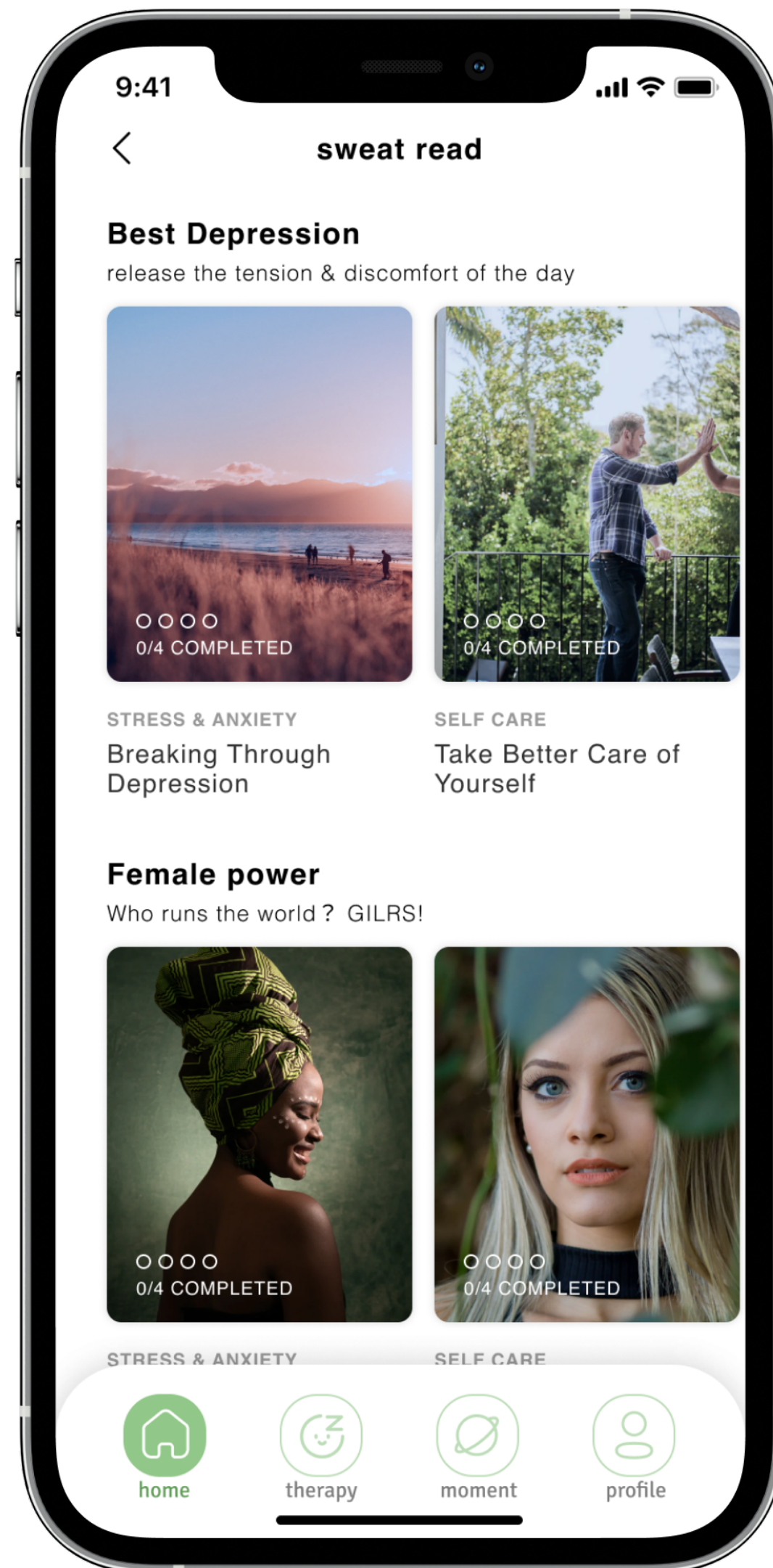
sweat read

Like the previous setting, swear read module also provides some articles in the form of voice reading, allowing players to listen to the articles in a gentle voice instead of reading with eyestrain.

The difference is that this module pays more attention to providing some motivational reading content, not related to sleep reminders. Through these positive reading content, readers can feel positive energy and relieve the negative emotions of inner depression.

sleep goal

Sleep goal module prompts users to set their own sleep goals (set an appropriate amount of sleep). With this setting, the software can intelligently set the wake-up alarm time according to the user's sleep time detected.
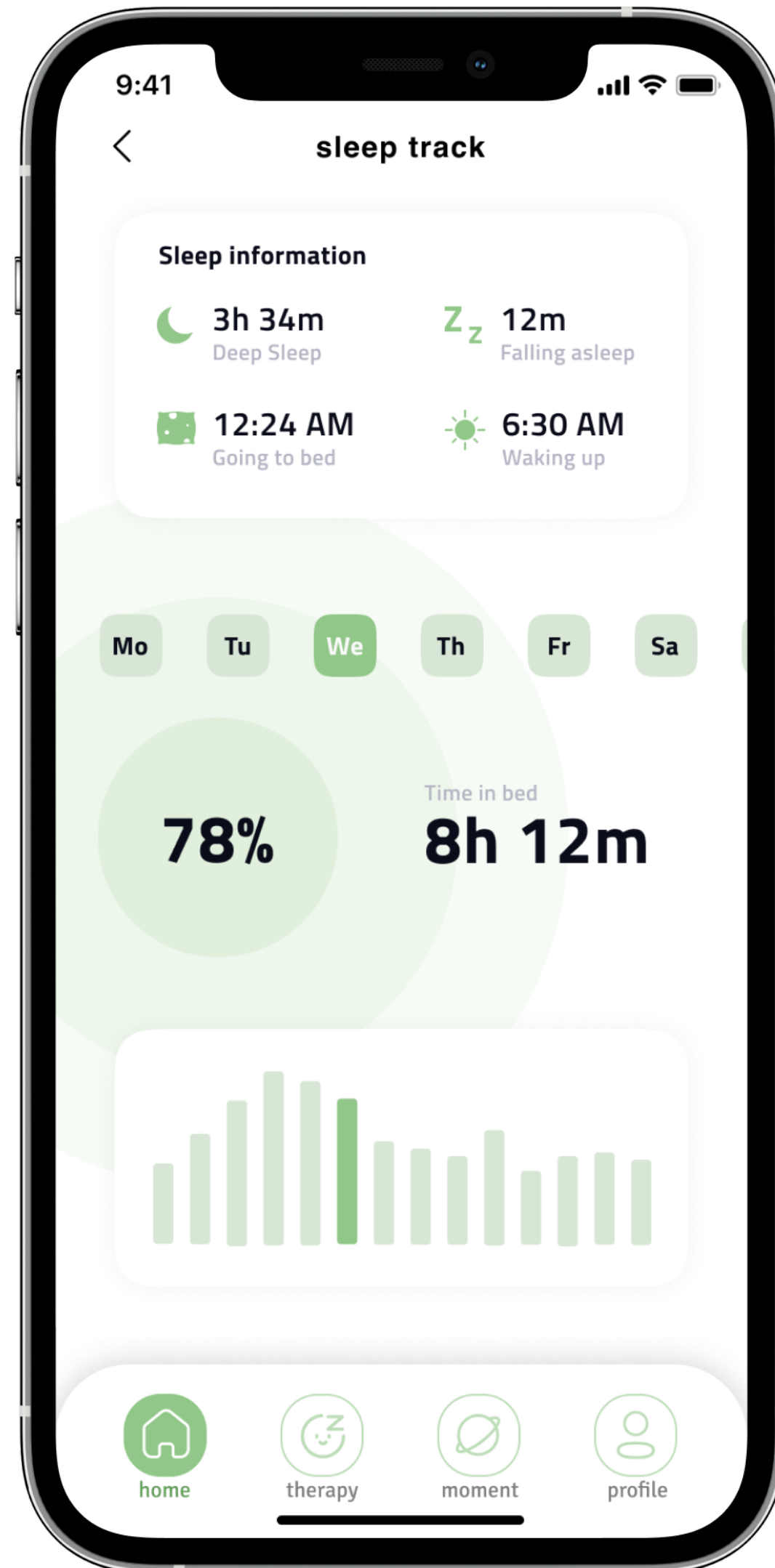
sleep track

Sleep track module shows a lot of sleep data related to users in detail, which includes deep sleep time, going to bed time, falling asleep time, waking up time, time in bed and so on.

In this way, it helps users better understand their sleep. In the later design improvement of the APP in the later stage, it will also consider adding the automatic generation system of sleep report assisted by AI intelligent technology. By analyzing these sleep data, it will provide users with sleep report conclusions and suggestions for sleep improvement, which will help users effectively improve their sleep quality.
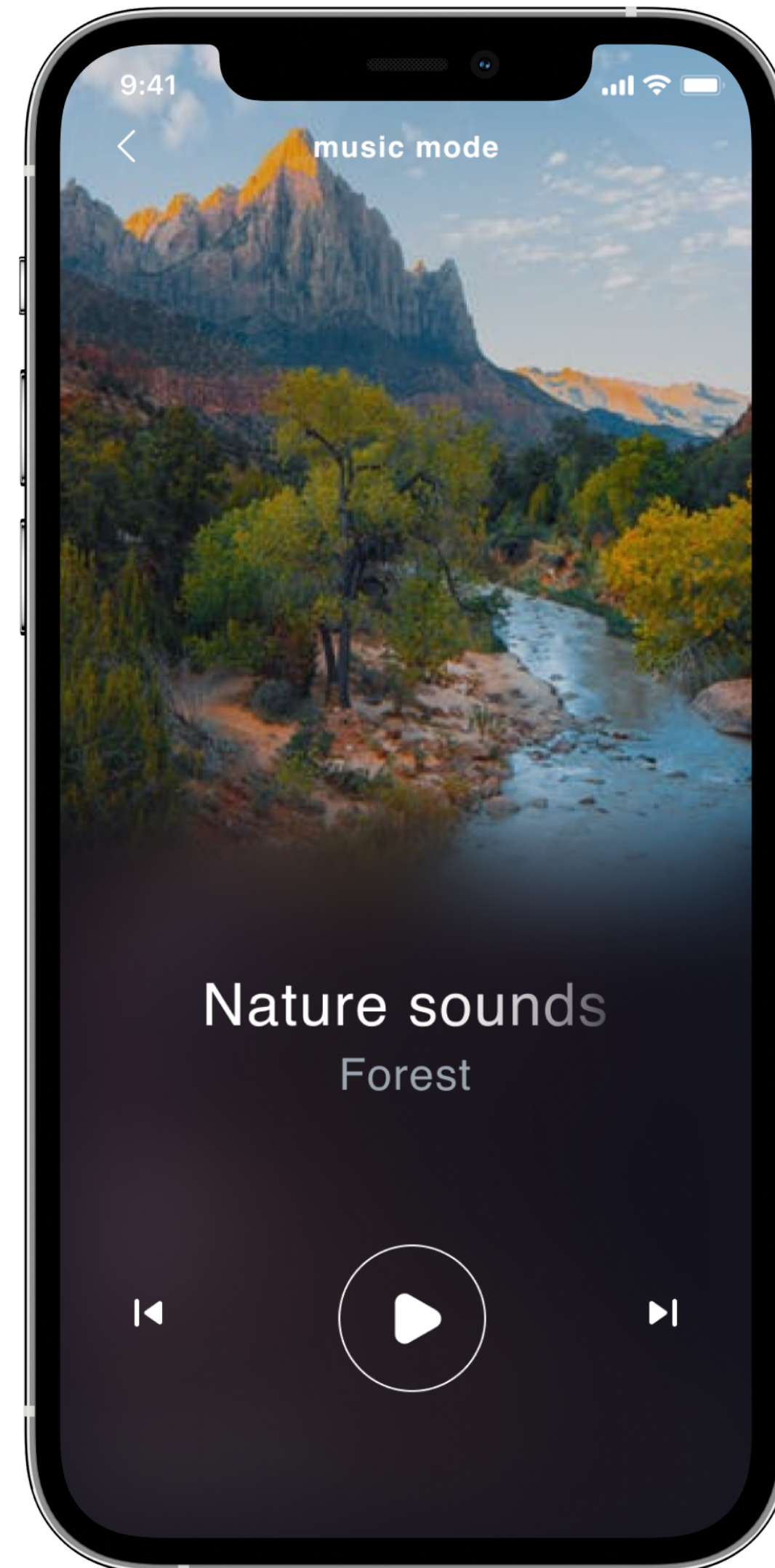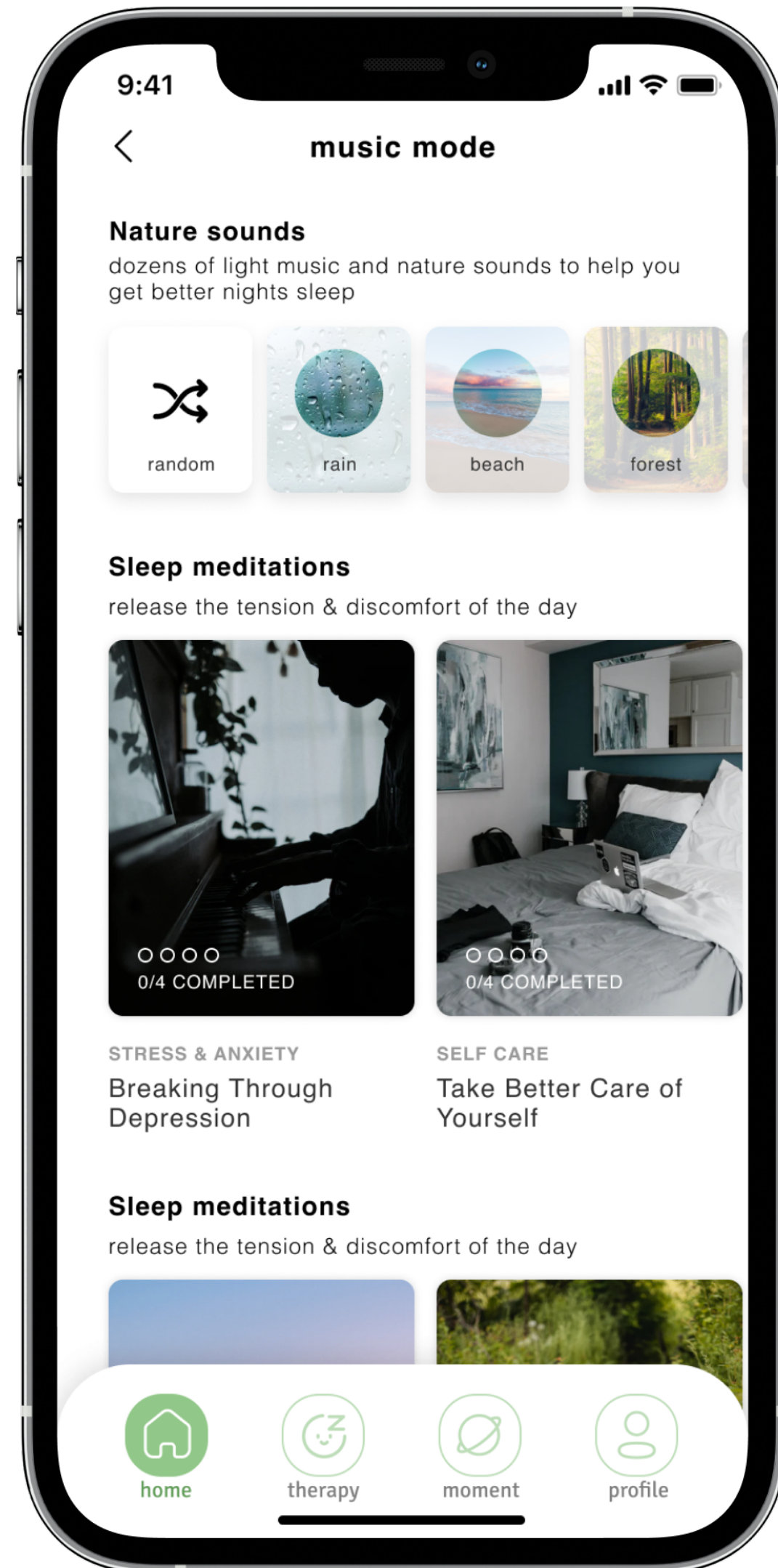
music mode

According to a recent meta-analysis of 10 sleep studies, music really can help you doze off—but not all music is created equal for sleep.

The meta-analysis revealed that while music can be a hugely impactful sleep aid, only music with a tempo of around 60 beats per minute has a profound impact on calming the mind and helping you nod off. Why? Because this tempo matches a resting heart rate of 60 BPM—a rate that's proven most conducive to restful sleep.
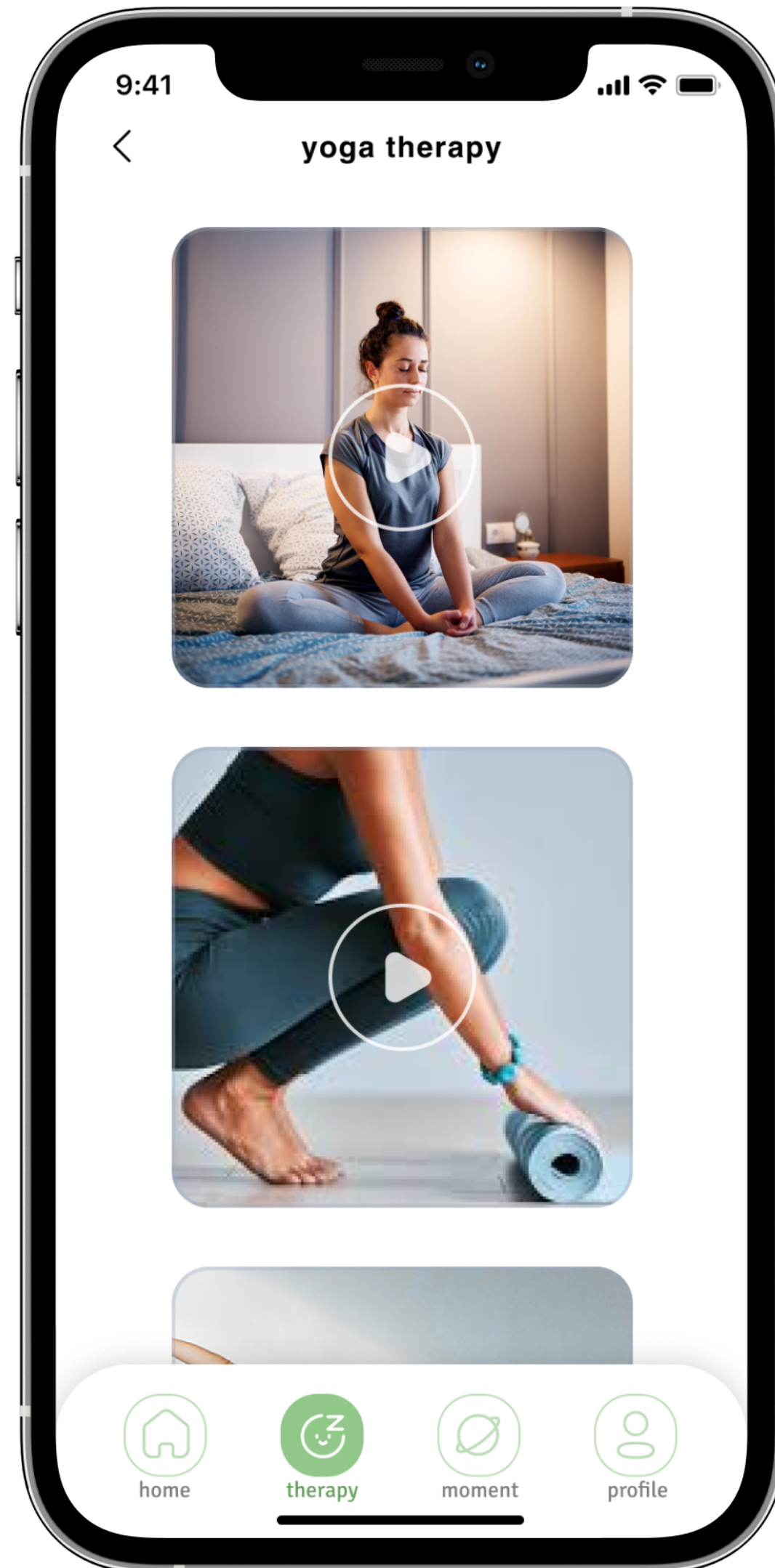
There are plenty of songs that fall around the 60 BPM range, including plenty of classical music and even some contemporary songs, like Joni Mitchell's 'Blue Room Hotel'. But what makes Marconi Union's 'Weightless' distinct isn't just its tempo. The song has other characteristics that make it profoundly relaxing: progression, length and construction.

4.4.2. Therapy

The function module of therapy provides three types of therapy which is more professional than the home module. The therapy includes yoga therapy, psychologist consultant and CBT-I theray.
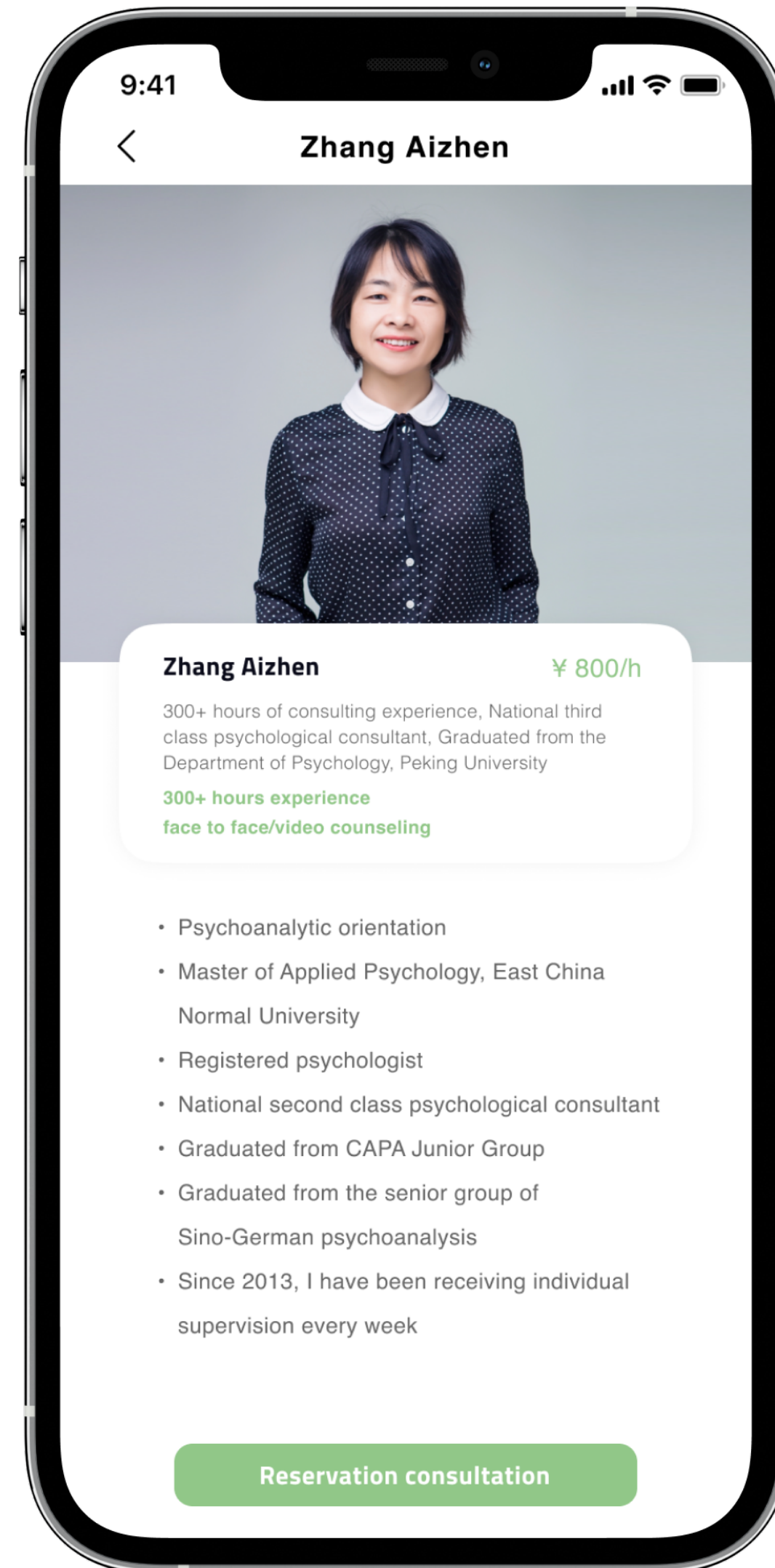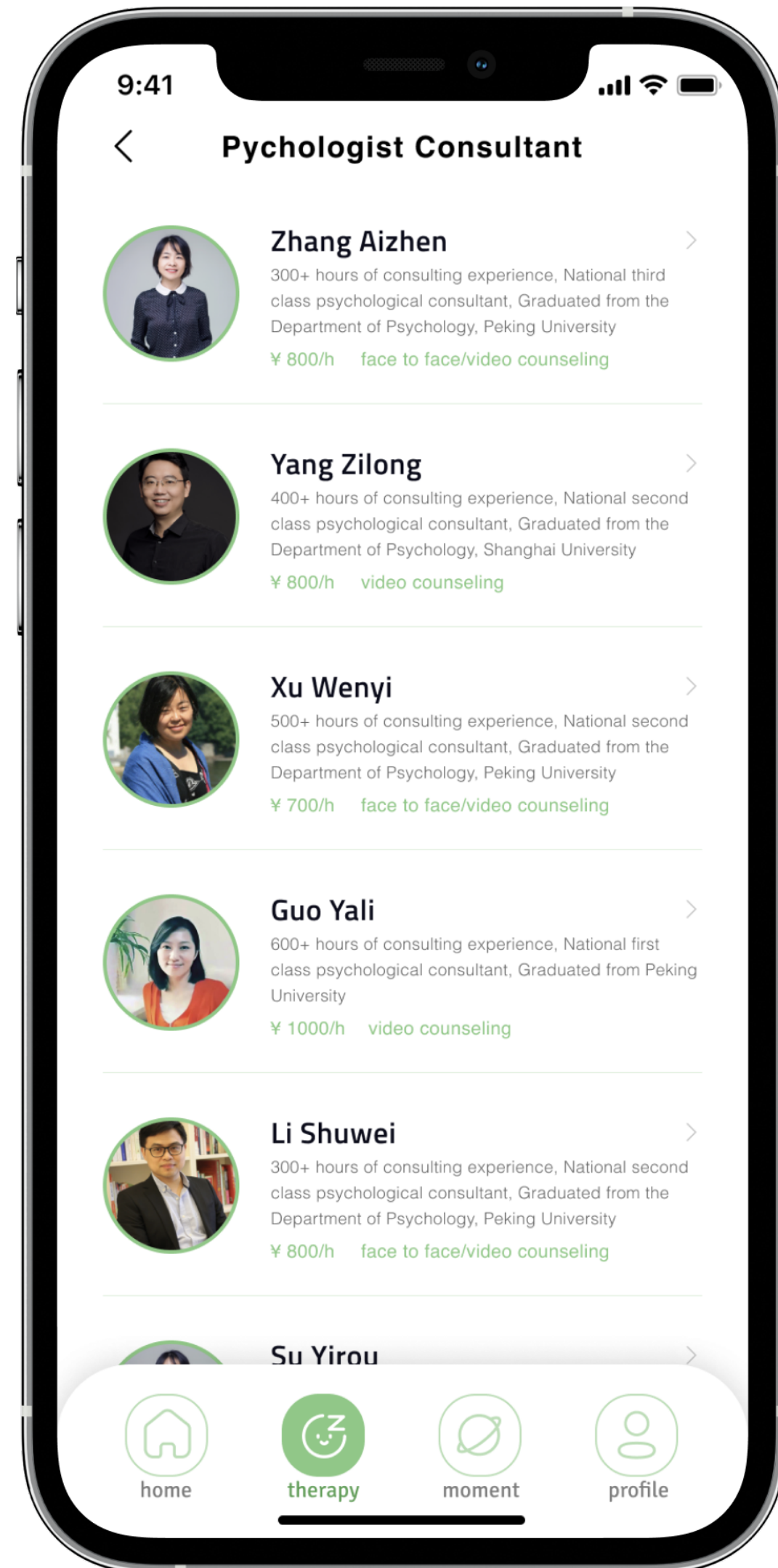
The design goal of this interface is still to show a warm and soft to users. Therefore, the large rounded corners are used as the function buttons, the soft white font with transparency as the title, and the light green as the background to show the functions carried by this interface.

yoga therapy

Yoga is a gentle and restorative way to wind down your day. A national survey found that over 55% of people who did yoga found that it helped them get better sleep. Over 85% said yoga helped reduce stress. You can use supportive props like bolsters, blankets, and blocks to make poses comfortable so that you can stay in the pose for longer and continue to breathe.

This function module provided some yoga teaching videos so that users can follow the videos to practice yoga before going to bed, relax the body and mind, and exercise breathing to achieve the effect of promoting the quality of sleep.

pychologist concultant

In many cases, people experience insomnia because they develop a pattern of behavior that interferes with good sleep habits. Sleeping difficulties are often connected to underlying problems such as stress, depression or anxiety.

It is a good idea to consult with a physician or another medical professional to learn if medical issues may be contributing to your sleep difficulties and treat related medical problems. Seeing a psychologist may also help you address sleep problems. Psychologists can help people change their behaviors and manage the thoughts, feelings and emotions that can interfere with a healthy night's sleep. Licensed psychologists have the professional training and skills to treat individuals suffering from depression and anxiety, which have been linked to sleep problems like insomnia.

In working with a psychologist, you can expect to talk about your overall physical and emotional health, and your health beliefs and behaviors. A psychologist will help you identify any underlying stressors and behaviors that may be interfering with sleep.
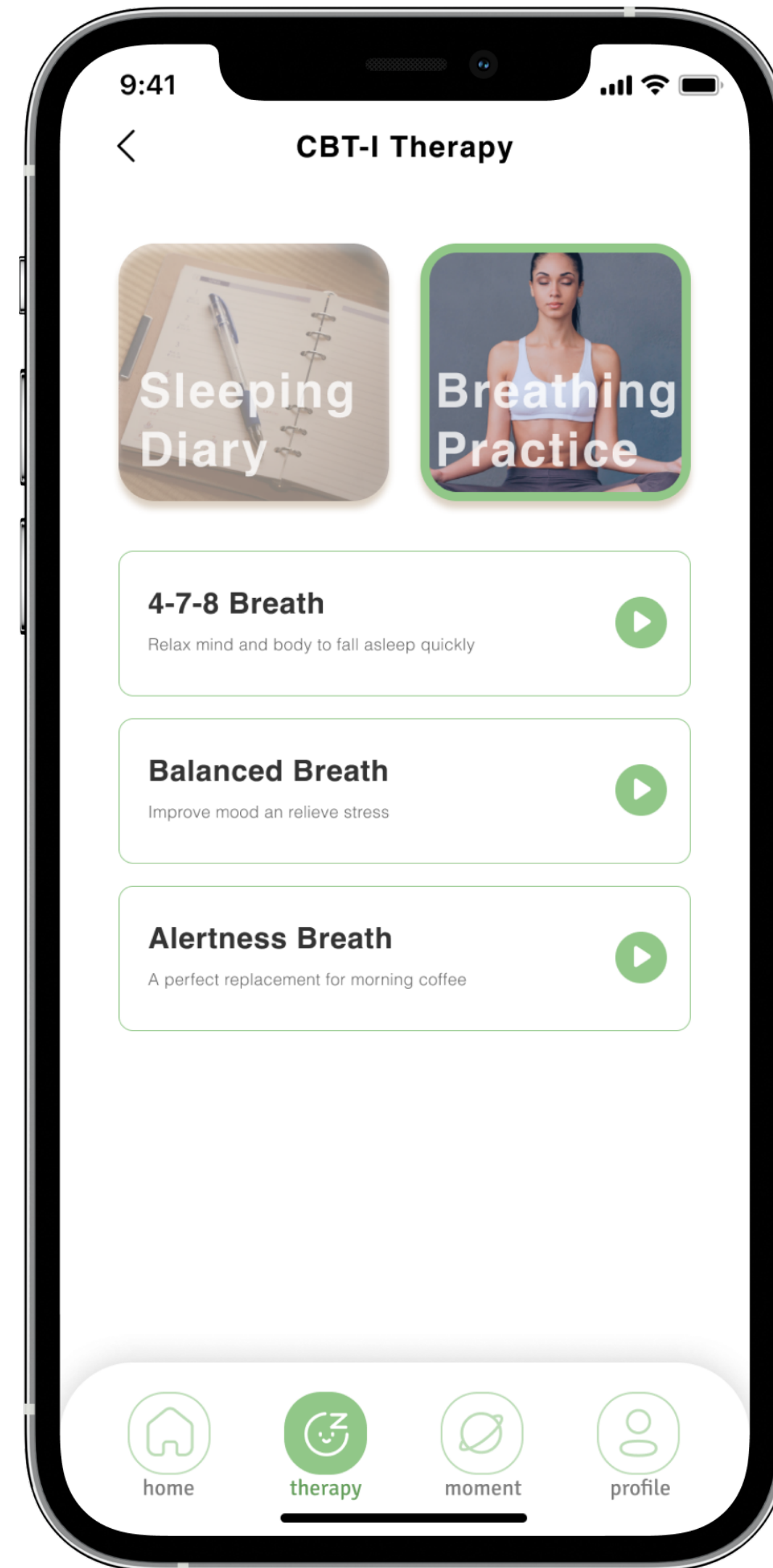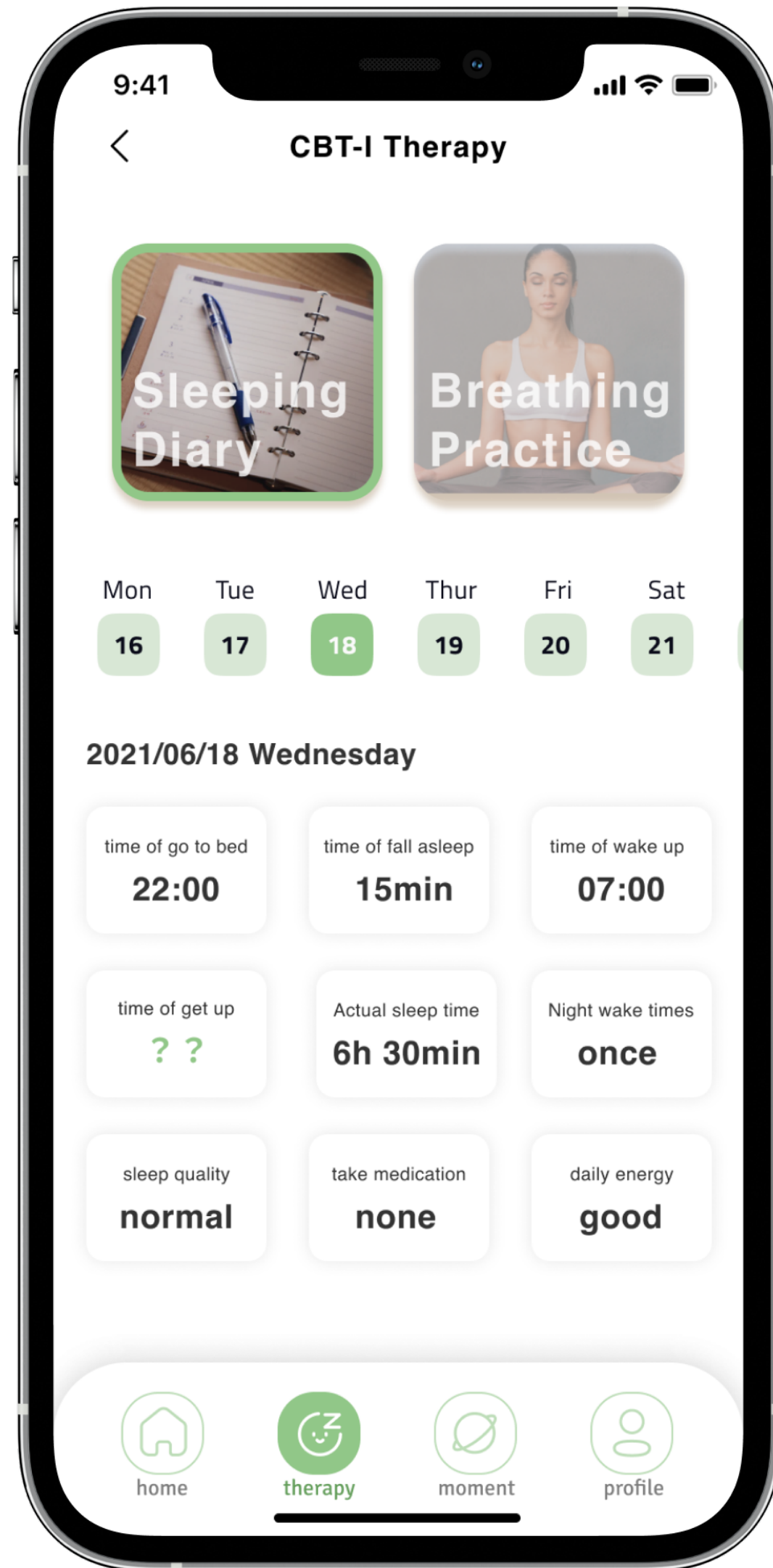
CBT-I theray

Cognitive behavioral therapy for insomnia (CBTI) is the most common psychotherapeutic treatment for insomnia. It is a 4 to 6 session treatment program that can help people who have difficulty falling asleep, staying asleep, or find that sleep is unrefreshing. CBTI includes a combination of behavior change procedures that include sleep hygiene education, stimulus control, sleep restriction therapy and relaxation therapy, as well as cognitive restructure.

Because this treatment often requires a high level of supervision and requires a high cognitive cost. Considering that APP-assisted therapy is difficult to achieve such a high level of supervision and education, I chose the treatment method that is better implemented and maintained in CBT-I therapy, which are sleeping diary and breathing practice.
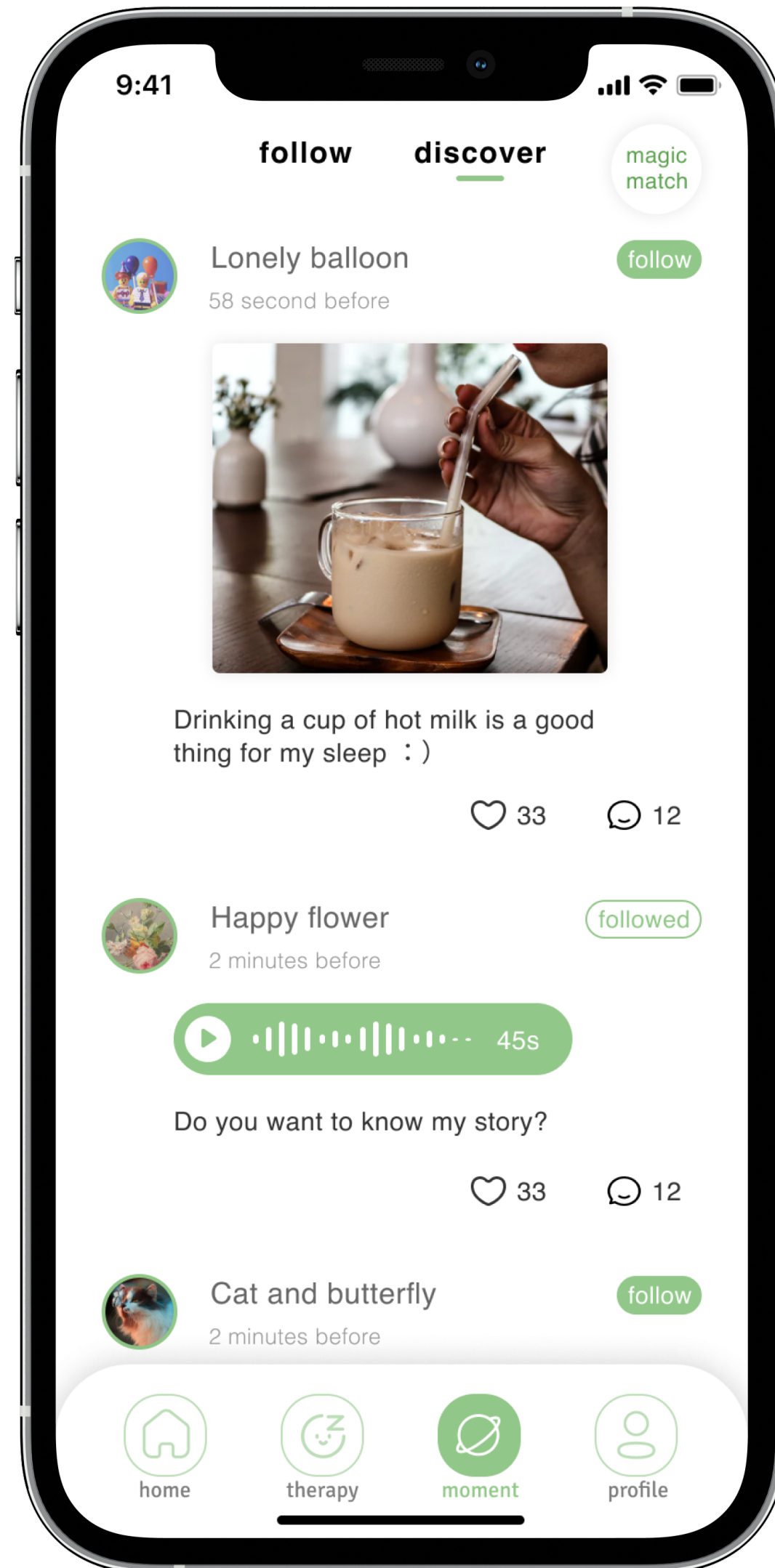
4.4.3. Moment

The function module allows users to send pictures and texts related to the healing moment and their voices. The rule is that there is a word limit, because reading words with a word count is not good for the user's sleep.

In addtion, people can follow or cancle following according to if they are interested to the content.
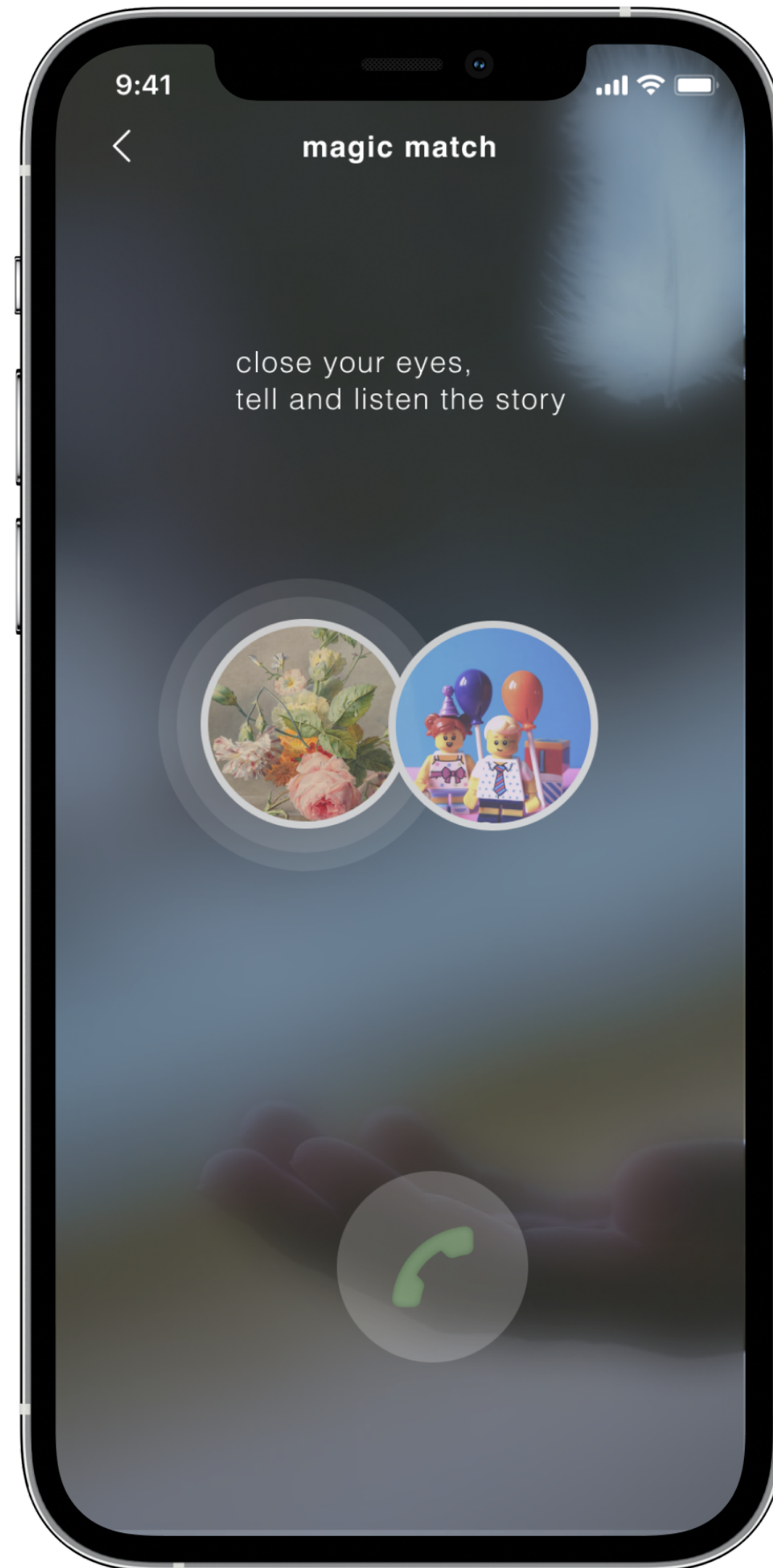
magic match

Magic match is an intersting function in the wholl application. The reason why this function is added is that many people suffered from insomnia due to a lot of terrible issues or stressful things that lead to emotional depression or fluctuations. From the research and literature we can found that, talking to strangers can effectively help relieve stress. In addition, this magic match only allowed them to chat with voice rather than typing words. It's also an effort to reduce the time users spend annotating the screen. The only thing users can do in the magic match is telling their stories or listening to others stories. People who don't know each other are here to talk and listen to each other, comforting each other's hearts.

There's actual evidence that complaining can help alleviate stress. In a study from last year, researchers found that venting in the workplace might actually be great for your mental health, helping you bond with co-workers and work through your feelings. And Dr. Stubits agrees that there's definitely something especially cathartic about complaining to a co-worker who gets why you're fretting about the company meeting, or to someone who just gets what

you're going through in general.

And it also be found that, when talking to strangers is easier than talking to people you know. When a friend, family member, or anybody else you know is with you, you may feel shy or timid. In other words, you feel uncomfortable. You're scared of what they might think and don't want them to have a bad opinion of you. Furthermore, you don't want them to discover your flaws or shortcomings. In reality, this is related to the negative image you have of yourself. In a certain way, you're actually ashamed of your physique, your social skills, or some other quality.

The thing is that, when you talk to strangers, the topics you discuss are usually unsubstantial or common. At any rate, it's as if you were following an imaginary script that you've already memorized and are comfortable with. Additionally, you can even play a different character, the person you want to be instead of who you really are. This is possible because the interaction will probably be short and it's unlikely you'll ever the stranger again.

Even psychologists believe that interacting with strangers is beneficial. According to a study by Dr. Elizabeth Dunn, a professor in the Department of Psychology at the University of British Columbia, talking to strangers makes people feel more cheerful, behave more pleasantly, and believe they belong in a community.
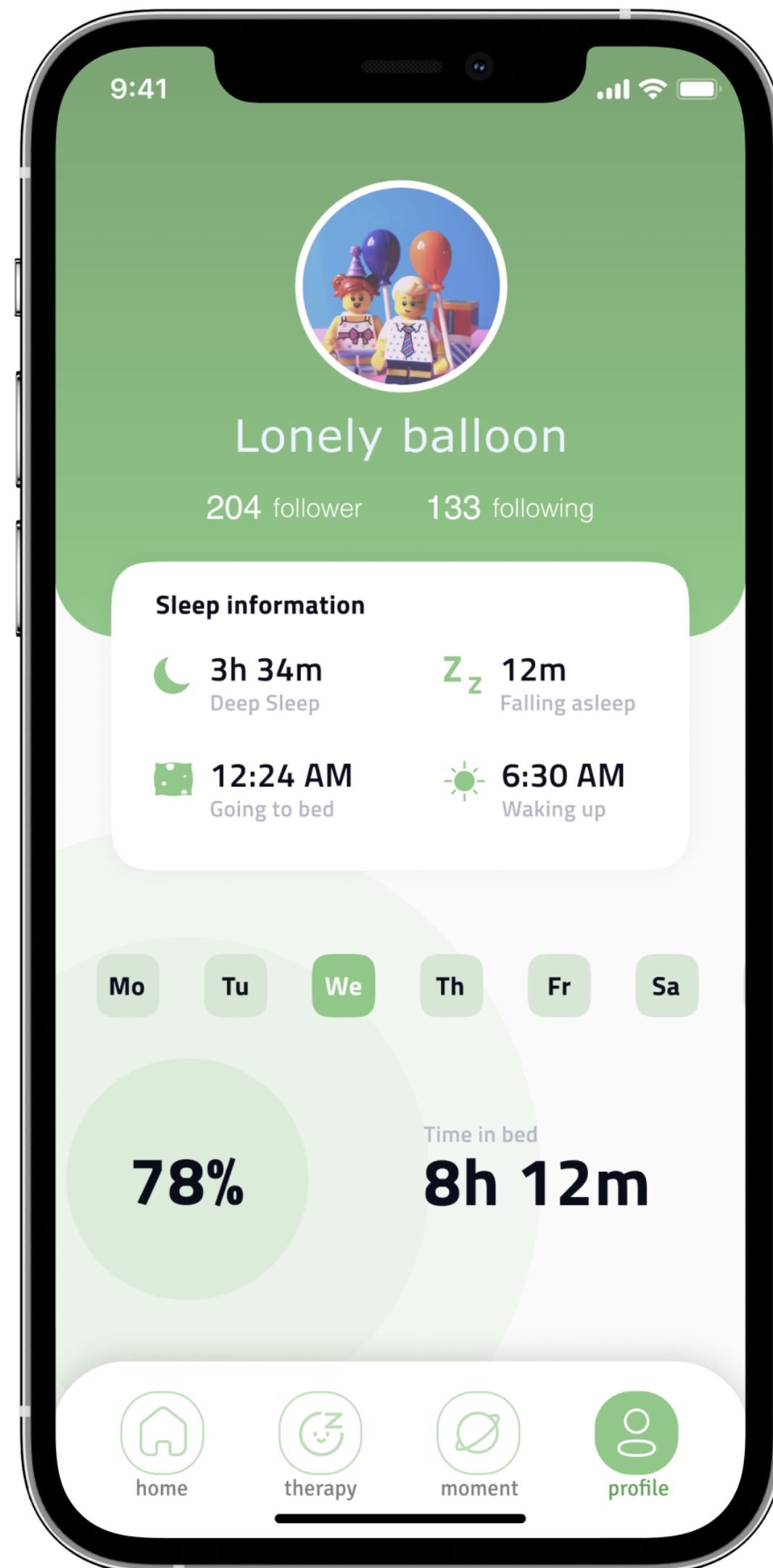
4.4.4. Profile

The profile page also maintains the dominant color style of the entire application. Users can see all the data related to them, including followers and followers related to Moment and all the data related to Sleep Health. In addition, users can set their funny name and change the profile photo for presenting in this page.

The data is presented in the same way as it showed in Sleep Track.

4.5. Dark Mode

As an APP which mostly been used at night, dark mode is an essential function. Therefore, Sweat Sleep provided dark mode for switching at night to create a better using environment for users.

From the Quentin's research (2018), we can know that bright Screens cause digital eye strain.

BRIGHT SCREENS

CAUSE SYMPTOMS OF DIGITAL EYE STRAIN

SYMPTOMS OF DIGITAL EYE STRAIN

About 80 percent of American adults report using digital devices for more than two hours per day and *59 percent report experiencing symptoms of digital eye strain.*

Eye strain — 32%

Neck and shoulder pain — 35%

Dry eyes — 27%

Headaches — 28%

Blurred vision — 28%
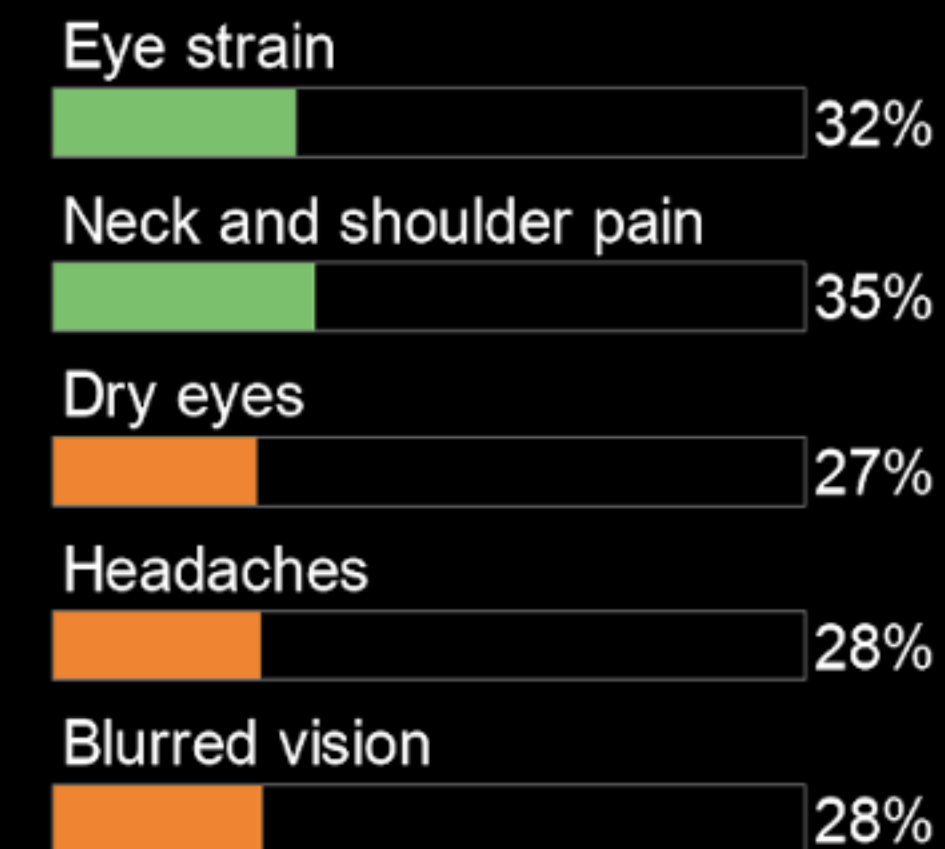
AVERAGE SCREEN TIME

American adults spend more than 11 hours per day watching, reading, listening to or simply interacting with media, according to a new study by market-research group Nielsen.

11+ HOURS

60% TV   15% Mobile   6% Desktop

For dark mode design, there still remains some important points to follow.

Firstly, it should avoid applying pure white in the design. A dark theme is not necessarily plain white text on a plain black background. In fact, this high contrast looks painful. It is safer to use dark gray as the main surface color of the component than true black (#000000). Dark gray surfaces reduce eye strain - Light colored text on dark gray surfaces has less contrast than light colored text on black surfaces. Dark gray surfaces can express a wider range of colors, heights, and depths because shadows are easier to see in gray (rather than true black). Material design recommends #121212 as dark theme surface color (Material Design, n.d.).

Dark Grey
#121212

The following tell you what is being asked for each item:

• Time to bed: Approximate time you went to bed to attempt to fall asleep.
• Time out of bed: The time you woke up and did not try to fall back asleep.
• Sleep latency: How long you think it took for you to fall asleep (does not have to be 100% accurate, just give your best estimation).
• Number of awakenings: How many times you woke up during the night.
• Time out of bed during awakenings: Estimated time out of bed before returning to fall asleep.
• Naps number/time: The total number of naps you've taken within the given day and how long they were.
• Sleep quality: Rate your sleep the previous night on a 0-4 scale with 0 being very poor sleep and 4 being very good sleep.
• Fatigue: Rate your levels of fatigue during the day on a 0-4 scale with 0 being no fatigue and 4 being very fatigued.
• Two chronic insomniacs between the ages of 20 and 24 were asked to use an insomnia journal to record their daily sleep status

High Emphasis

87%   #FFFFFF

Medium Emphasis

60%   #FFFFFF

Disabled

38%   #FFFFFF

And here shows some of Sweat Sleep's interface designs in dark mode.
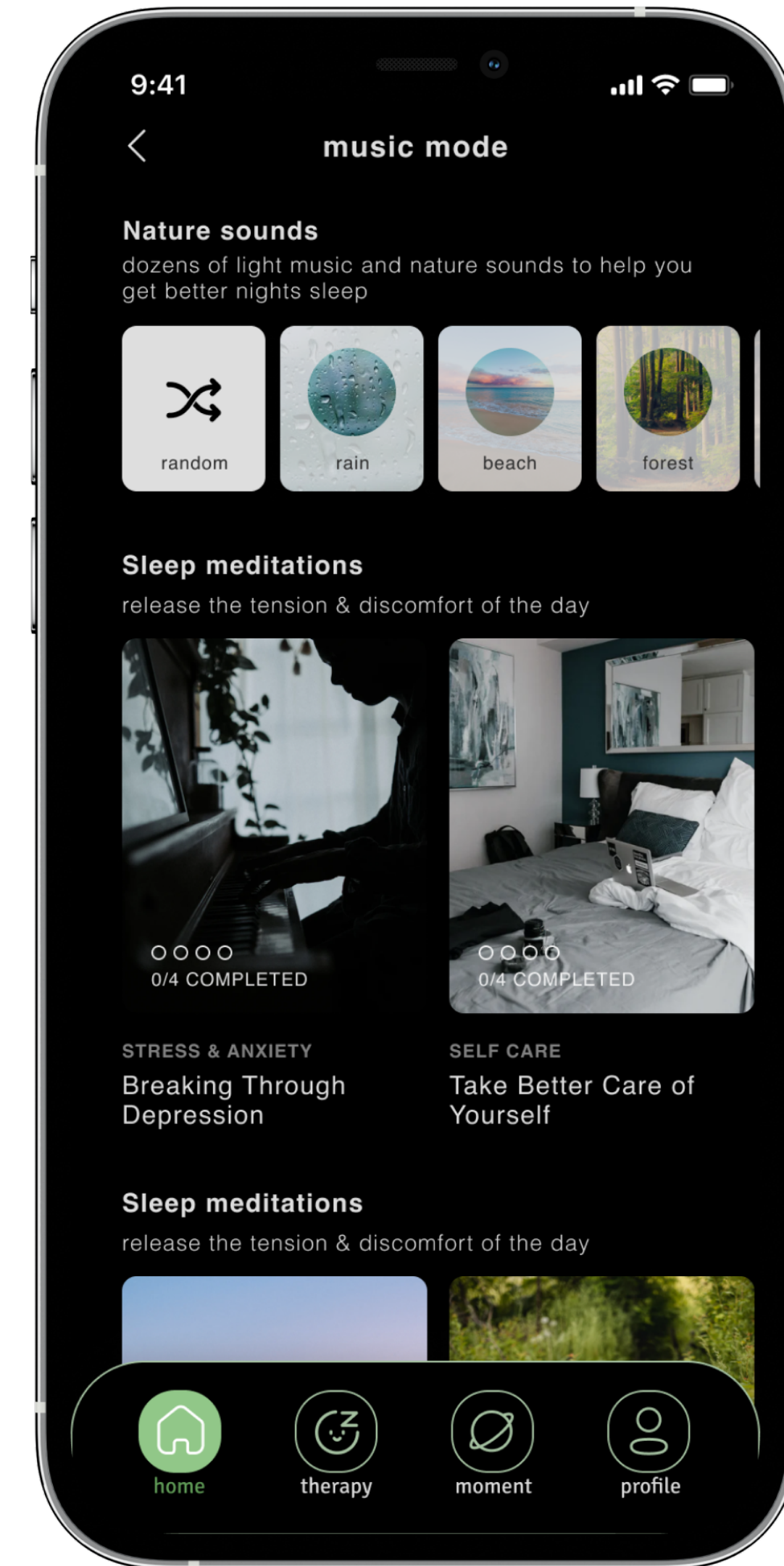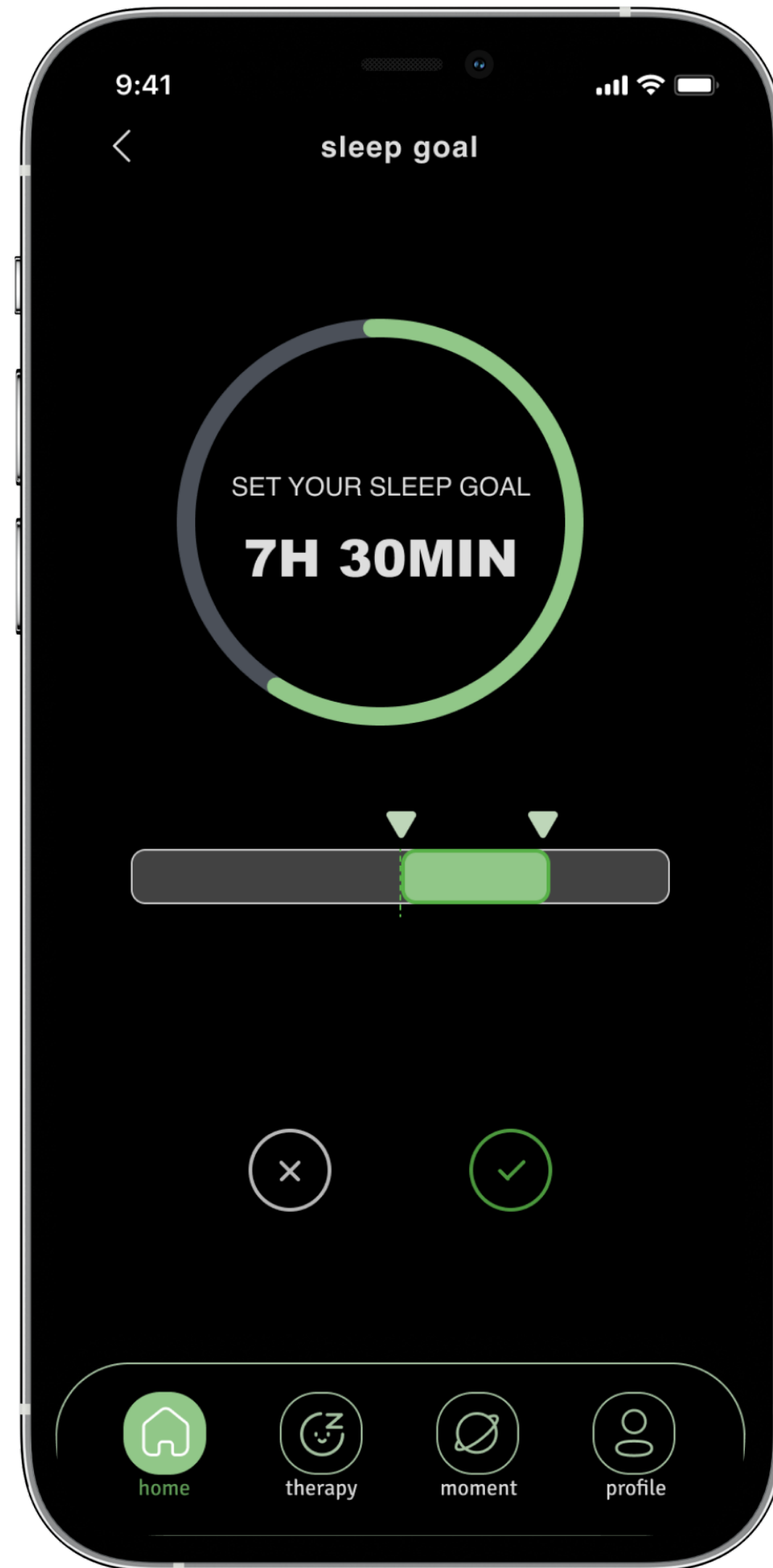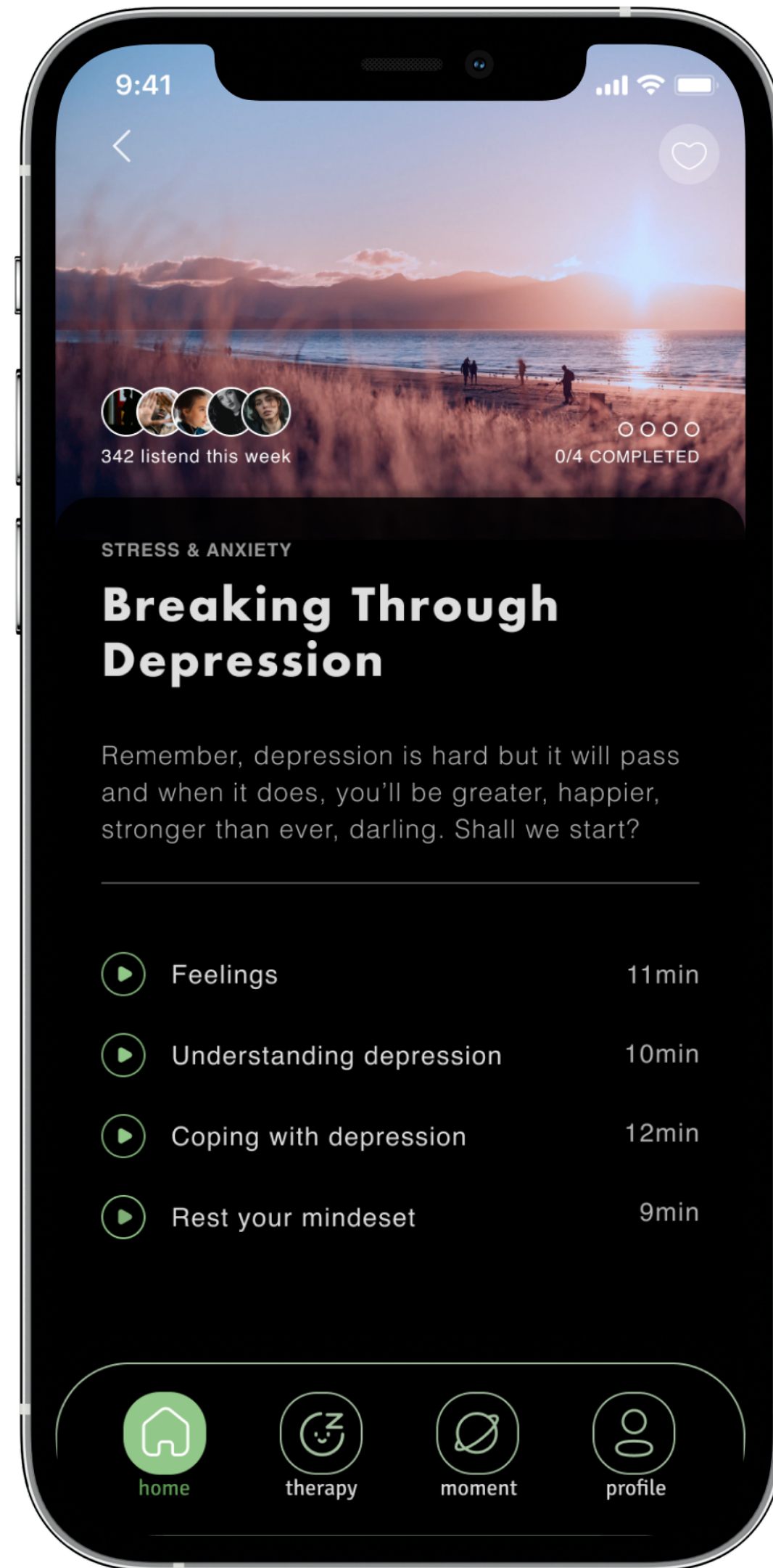
Chapter 5
Feedback

5.1. Feedback

After the high-fidelity design of the interface, I conducted a simple user test. Since there is no functional model prototype, it is impossible to truly and rationally test the degree of help of the application to patients with insomnia. Only a simple interface jump can be performed to let users understand the function of the application. So this feedback may not be perfect.

I asked three friends with different levels of insomnia to use sweat sleep, which can simply jump to the interface, assisted with some necessary explanations, and then interviewed their feelings and opinions on this application.

The good part is: They think that the module division of this application is very clear, for patients with mild or severe insomnia, they can meet their needs very well, and they like the dark mode setting very much, they think it is good for a night For users, a non-glaring screen is a must. And they all expressed their love for the overall design style. The green color makes them feel the comfort of being in nature, and the simple interface makes them more happy when using it.

They have different opinions on the magic match function. Some people think this is a very novel function, and they think that telling strangers about the bad things of the day must be very decompressive. But some people feel that calling a stranger makes him unacceptable and feels that it exceeds his social awareness. He thinks that if there is a choice of text communication, he will prefer this feature.

The bad aspect is: in the sleep data display function, they often express their incomprehension of the data. In other words, simply displaying sleep-related data is of low reference value for users. Users more hope to see conclusive or suggestive text intuitively, so that they can better understand their sleep status and how to improve their sleep more clearly.

Due to the compact time of this design cycle, the test samples and conditions are very limited, so the feedback dimension obtained by the test is not comprehensive enough. But we can also get some useful user results from it.

Chapter 6

Project Discussion

6.1. Project Discussion

The motivation of this research and design comes from the bad experience of insomnia and the general feedback of Chinese young people around. And the aim of this design is to target Chinese young people with different levels of insomnia and provide them with a variety of sleep assistance.

The final app: Sweat Sleep can not only provide a wide range of sleep knowledge, but also some mild sleep quality improvement functions, so that insomnia users can better understand their sleep conditions and how to improve sleep quality. It can also better combine some common insomnia therapies to provide users with more professional sleep assistance. Additionally, the overall design style follows the natural color style, while providing dark mode switching options, in line with the main use time range of the product. At the same time, the overall design principles follow to reduce the amount of reading, and use voice playback instead of reading text. As much as possible to reduce the impact of night reading on sleep.

However, It is a pity that the overall design cycle is limited, so it is impossible to realize the true display of functions, and it is impossible to conduct user experience testing with real scenes and usage conditions. Therefore, the user feedback obtained only stays in the user's envisioned functional understanding and visual experience. Therefore, the therapeutic effect of this product on insomnia cannot be accurately concluded.

There are actually many ideas about the future planning of this product. First of all, I will look for a like-minded software development engineer to implement this product functionally. At the same time, professional psychologists will be invited to test and evaluate this product, and some expert suggestions will be collected to make corresponding adjustments and improvements. For this type of insomnia treatment auxiliary app, functionality is the most important point. After achieving these functions and iterations, you can find some target users to perform functional tests to test whether there is a treatment and improvement effect for different degrees of insomnia. I was quite confident and approved of the direction of this product.

Chapter 7

Bioliography

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