Scientific and Social Research, 2025, Volume 7, Issue 6
https://ojs.bbwpublisher.com/index.php/SSR
Online ISSN: 2981-9946
Print ISSN: 2661-4332

Product Design for Instant Stress Relief: A Study on Fragmented Scenes for High-pressure Groups

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Abstract: Increasingly severe fragmented stress problems. Through systematic analysis, this study finds that such stress has three major characteristics: high frequency, instantaneity, and contextualization. The causes mainly come from the fast-paced workplace culture, the "always online" mode of smart devices, and individuals' procrastination coping strategies. Research shows that 92% of urban residents will spontaneously take stress-relieving actions within 3 minutes after stress occurs, presenting a behavioral pattern of "immediate relief — quick switch — minimum cost." Based on this, this paper proposes a complete set of stress-relief product design strategies. First, achieve psychological regulation through multi-sensory feedback; second, adopt the design principles of simplicity and contextualization; and finally, develop intelligent stress-relief products with a three-level feedback system. Empirical data from the MIT Media Lab show that such products can increase the efficiency of emotional release by 40%, effectively meeting the immediate stress-relief needs of modern people in fragmented scenarios. This study provides a theoretical basis and practical guidance for the design of stress management products.

Keywords: Timely stress relief; Stress-relief products; Product design; Interactive experience

Online publication: June 13, 2025

1. Introduction

With the acceleration of digital transformation, the Chinese Academy of Social Sciences mentioned in 2023 that the number of stressful events faced by Chinese workplace populations per week has surged from 3.2 in 2019 to 8.7 in 2023. The cumulative effect of this "micro-stress" has led to persistent anxiety symptoms in 75% of respondents. Traditional stress relief products, with slow response times averaging 15 minutes to take effect and poor scene adaptability, have become inadequate to meet modern needs. Based on stress cognitive evaluation theory and emotional design framework, this study proposes the "3E" design principles for instant stress relief products: Effective (rapid onset), Embedded (scene embedding), and Emotional (emotional connection), verifying their effectiveness through biofeedback experiments. According to 2023 World Health Organization data, approximately 70% of the global workplace population experiences cumulative "micro-stress" issues. The Chinese

Psychological Association's "2024 White Paper on Urban Stress" indicates that 92% of respondents require instant stress relief solutions within 5 minutes. Therefore, there is a growing need for portable products that alleviate stress, which can create an emotion that helps reduce stress and promote a harmonious atmosphere.

2. Analysis of instant stress relief needs and scenes for high-pressure groups

2.1. Background and characteristics of fragmented stress formation in high-pressure groups

Modern populations face fragmented stress, making it difficult to effectively release emotions. Fragmented stress in high-pressure groups exhibits three distinct characteristics: high frequency, instantaneity, and contextualization. This type of stress demonstrates high-frequency outbreaks. According to Li Min et al.'s 2023 study in "Acta Psychologica Sinica", Chinese workplace populations experience an average of 7.2 micro-stress events per day [1]. A 2022 study by Smith et al. revealed that urban workplace populations encounter an average of 5–8 short-lived stress events daily, forming a unique "pulsed" stress pattern. However, each stress event lasts for a short duration, typically under 10 minutes (**Figure 1**). The Chinese Psychological Association proposed in 2023 that 67% of stress events last less than 5 minutes [2]. It is worth noting that this type of stress has a strong situational dependence, often deeply tied to specific scenarios such as task interruptions at work, crowded commuting environments, or temporary meeting notices. This fragmented stress pattern reflects that stress sources in modern work life originate from dispersed stress points, rather than single significant events, requiring targeted instant intervention measures.

The causes of fragmented stress in high-pressure groups can be analyzed from three dimensions: social, technological, and individual. At the social level, the fast-paced modern workplace culture has led to task fragmentation. Multifaceted and multilevel work results in dispersed stress, such as the performance-oriented management style that keeps workers in a continuous low-intensity stress state. On the technological front, work has transformed into an "always-on" mode with the widespread adoption of intelligence. Instant messaging tools contribute to the fragmentation of attention among workgroups. For instance, a sudden work assignment from a superior after work hours can trigger negative emotional stress. At the individual level, procrastination has become the norm among modern populations. Adopting passive coping strategies against stress sources leads to the accumulation of short-term stress, further exacerbating the psychological load of high-pressure groups.

In summary, fragmented stress in high-pressure groups originates from multiple sources, causing individuals to accumulate stress in various scenarios. This leads to the externalization of stress and increasing emotional repression.

Figure 1. Frequency and duration of pressure outbreaks (Image source: Created by the author)

2.2. Behavioral logic and trigger mechanism of immediate pressure relief needs

A portion of stress often originates from a few seconds and is of an immediate nature. When facing sudden stress, modern people often follow the behavioral logic of "instant emotional relief — quick emotional switching — minimal cost to achieve emotional release." When stress hits suddenly, people instinctively seek quick and

effective ways to relieve it, such as deep breathing, playing small games, or taking a brief moment of emptiness. This demand is essentially an "instant gratification" for emotional regulation, like pressing the pause button for tense nerves. At the same time, effective stress relief behavior must seamlessly connect with the current scene — the office requires subtle and unobtrusive methods, such as small desktop toys (**Figure 1**), which not only achieve minimal cost for emotional release but also allow emotions to be quickly relieved and switched to the corresponding state.

The trigger mechanism for immediate stress relief needs stems from the body's automatic stress response. When exposed to external stimuli, such as sudden work instructions, interpersonal conflicts, or environmental disturbances, it prompts the rapid secretion of adrenaline, leading to physiological changes like accelerated heartbeat and muscle tension. If this stress state is not relieved in a timely manner, it will continuously consume psychological energy. According to a 2023 behavioral psychology report, 92% of city dwellers spontaneously initiate some form of stress relief behavior within 3 minutes of feeling stressed. This trigger-relief loop is characterized by immediacy, contextuality, and personalization, providing an important basis for the design of stress relief products.

As a result, there is a growing demand for timely stress relief, requiring short-term measures to alleviate negative emotions, meet the psychological compensation of different groups, release pent-up emotions, and achieve minimal cost for emotional release.

Figure 1. Small desktop stress relief toys (Image source: Internet)

2.3. Typical scenario extraction for fragmented scenes

Different fragmented scenes can evoke specific negative emotions. American psychologist Lazarus proposed the emotional cognition theory, which advocates that human emotions are influenced by environmental events, physiological conditions, and cognitive processes [3]. According to a 2024 cross-cultural study, 92% of repressed emotions are scene-dependent. Work break scenes can reduce people's cognitive abilities, and multitasking can increase error rates, leading to a surge in stress and repressed emotions.

Based on various studies, let's look at several typical scenes. Different scenarios can evoke different negative emotions in people, leading to the externalization of stress (**Table 1**).

Table 1. Manifestation of stress from typical scenarios (Image source: drawn by the author)

Scenario type	Typical stressors	Induced stress types
Work scenario	1. Forced work interruption 2. Drastic workload increase	1. Cognitive interruption stress 2. Task overload stress
Commuting scenario	Rush hour crowding	Loss-of-control anxiety stress
Home scenario	1. Rest interrupted 2. Poor hygiene conditions	1. Recovery obstruction stress 2. Environmental aversion stress
Social scenario	Long waiting times (e.g., restaurant queues, waiting for friends)	1. Time perception stress 2. Social expectation stress

In general, different scenarios induce different types of stress, all of which originate from negative emotions. People need a perfect outlet to vent these emotions, which can improve the quality of subsequent work and study, and also effectively alleviate mental health issues.

3. Design strategies for stress relief functions and product design

3.1. The concept and psychological mechanism of stress relief functions

Stress relief functions help individuals release pressure and alleviate tension through specific methods. Their core purpose is to provide consumers with effective ways to release pressure, reduce physical and mental tension, and ultimately improve mental health. As Adler believed, when a person feels inferior to others, they may experience feelings of inferiority, and he also suggested that people have a motivation to seek superiority, thus compensating for feelings of inferiority [4]. Based on the above, the interactive mechanism to achieve psychological adjustment mainly involves three aspects.

Firstly, tactile feedback design is utilized to elicit a response from the skin. Experiments have confirmed that stress levels can be reduced by 25%–30%, triggering the release of serotonin in the brain. Sensory feedback is an indispensable part of the stress relief function, as it can enhance the experience and lead to emotional release.

Secondly, tool-assisted methods are employed to strengthen the sense of control. Utilizing complementary products can improve people's inner compensation mechanism, increasing dopamine secretion by 15%–20%. For example, in Hong Kong, a slipper was designed as a complementary product for stress relief toys, facilitating an immersive experience and providing higher emotional feedback.

Lastly, sound effects are incorporated to regulate emotional balance. The sound emitted by the product during interaction increases heart rate variability by 18%–22%. For instance, a product may incorporate a mechanism similar to that of a screaming chicken toy, which makes a sound when squeezed, enhancing the user experience.

In conclusion, the synergistic effect of multiple aspects makes the stress relief function an effective psychological adjustment system for coping with the pressures of modern life.

3.2. Types and development of product design

Product design is a functional, aesthetic, and usable entity that integrates creativity and technology. It can be classified into various types based on different dimensions and goals. According to functional attributes, it mainly includes practical product design, which focuses on functionality (e.g., home appliances, tools), experiential product design that emphasizes user emotional interaction (e.g., smart wearable devices), and healing design with psychological adjustment functions (e.g., stress relief toys as shown in **Figure 3**).

Modern product design has evolved from being a single product to being aligned with people's psychological needs. In terms of design dimensions, it has shifted from being "function-centered" to being "human-centered", with more focus on user experience and social value. For example, healing product design incorporates local folk culture. Emotionally, precise multi-modal sensory stimulation directly affects the user's limbic system, activating a pleasant emotional response. From a social identity perspective, specific cultural symbol systems are integrated. This design strategy elevates the product beyond its practical function, making it a material carrier for users to construct their social identity and achieving a value transition from being instrumental to being symbolic.

In summary, product design is moving towards a human-centered approach. Different products offer varying functional and emotional values, providing diverse experiences to different groups of people.

Figure 3. Stress relief toy (Image source: Internet)

3.3. Core elements and methods of immediate stress relief product design

Rapid stress relief is the core of immediate stress relief products. However, tactile, auditory, and visual multimodal feedback form the foundation of stress relief. For example, squeezing a stress relief toy activates tactile senses through tactile feedback, triggering the release of serotonin in the brain and quickly achieving stress relief. This type of product is relatively simple and direct to use, allowing users to squeeze and relax for stress relief [5]. In 2023, Nature Neuroscience proposed that specific frequencies of sound waves can stimulate nerves and relieve stress. For instance, respiratory guidance stress relief products utilize specific sound waves to stimulate the parasympathetic nervous system.

In terms of design elements, immediate stress relief products should follow the principle of simplicity. An experiment at the University of Manchester showed that simple repetitive actions reduce cortisol levels by 23% more than complex puzzle-solving tasks. Therefore, simple operational conditions can bring faster physical and mental pleasure. In terms of operational conditions, instant feedback can enhance the sense of pleasure, such as the sound effect of bubble wrap popping. When designing stress relief products, timely feedback and simple operation are more conducive to enhancing people's positive emotions. The entire process must be completed almost "unconsciously" and naturally, requiring no preparation and creating no additional burden, just like a conditioned reflex integrated into the rhythm of daily life. This low threshold and high adaptability are the core logic of immediate stress relief product design.

Therefore, when designing immediate stress relief products, attention should be paid to incorporating tactile and auditory elements. The design should also be kept simple in terms of both form and operation, facilitating faster emotional changes when people interact with the product.

4. Practice of designing stress relief products in immediate scenarios

4.1. Positioning of stress relief products in immediate scenarios

In immediate scenarios, stress relief products should closely align with users' needs for emotional catharsis and instant gratification. Through interactive, fun, portable, and low-threshold designs, these products provide a rapid stress relief experience. Zhang Wei proposed the "5-second principle", stating that effective stress relief products should produce positive feedback within 5 seconds [6]. These designs typically adopt portable, user-friendly operations and quick feedback mechanisms. Through physical interaction or sensory stimulation, they help users achieve a relaxed state and alleviate inner anxiety in a short time [7]. Their core value lies in providing an instant emotional outlet through interactions such as hitting, destroying, or squeezing, offering both entertainment and stress relief. Unlike traditional stress relief toys, these products are portable and incorporate interactive sound effects. Using these products not only releases emotional stress but also enhances user engagement. The target audience primarily consists of high-pressure professionals, students, and young people, meeting their need for stress relief during fragmented time. By combining portability with stress relief products, they not only satisfy immediate stress relief but also become symbols that carry group emotions, achieving both product dependence and emotional release.

In summary, products that combine entertainment and immediate stress relief are more competitive in modern society. They allow consumers to timely vent their dissatisfaction with life and things and engage in cathartic behaviors, thereby alleviating negative emotions.

4.2. Transforming timely decompression products in fragmented scenarios

Modern psychological research has shown that high-pressure environments are more likely to quickly trigger negative emotions such as anxiety and depression, and decompression products can provide instant emotional regulation through physical or virtual interactions. According to a 2022 survey by the American Psychological Association, 85% of people under high pressure tend to relieve stress through "destructive behaviors" such as hitting and squeezing. These behaviors can stimulate the brain to release dopamine and temporarily inhibit the secretion of stress hormones. Targeting the sources of stress for high-pressure individuals in fragmented scenarios, transforming products into attacks on tangible objects aligns with the psychological theory of displacement aggression, where consumers project real-life stress onto manipulable objects, avoiding real interpersonal conflicts. Therefore, decompression products not only satisfy the need for timely emotional release but also enhance the psychological healing effect through specific actions, such as squeezing an object to release emotional pressure when stress increases.

In terms of design transformation, the portable spherical design allows the source of stress to be tangibly represented anytime and anywhere, aligning with the theory of metaphorical concretization in cognitive psychology and improving the efficiency of emotional transfer. Adopting a simplified spherical shape, the design aims to be easily carried by various groups. The outer layer utilizes a soft, rubbery material that ensures it can be hit, squeezed, and kneaded while also possessing slow resilience. By adding a perfectly adhesive material, hanging rope to the top of the product, consumers can use the rope to relieve stress through squeezing and hitting behaviors in different fragmented scenarios where stress is externally manifested (**Figure 4**). This can increase consumers' pleasure during interaction with the product, utilizing the product's reversible "destruction-restoration" mechanism to allow users to experience a sense of control within a safe range, avoiding real violent tendencies. Additionally, a built-in pressure sensor can trigger sound effects or vibration feedback in a timely manner when hit, enhancing the sense of catharsis.

Based on previous theoretical research and practical validation, a three-stage closed-loop design framework

of “perception-feedback-regulation” has been constructed. This framework integrates the pressure perception layer with a multi-modal signal acquisition system, the intelligent feedback layer with a dynamic response algorithm engine, and the emotional regulation layer with a multi-sensory collaborative output mechanism. By combining timeliness and portability, decompression products form a three-tier progressive relationship of “external manifestation of stress — behavioral hitting — stress catharsis.” The combination of specific characters, objects, and products more closely aligns with the objects consumers want to vent their emotions on, enabling them to immerse themselves more deeply in the hitting behavior and thereby release their pent-up emotions.

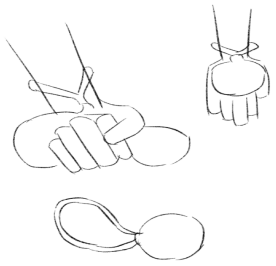

Figure 4. Squeezed State (Source: Drawn by the author)

4.3. Interactive experience design for stress relief products in immediate scenarios

Interactive experiences in product design allow consumers to quickly grasp the product’s design philosophy in timely scenarios, enabling immersive product usage and maximizing the effectiveness of the product’s functionality. In interactive experience design, focus is placed on the interactive experience between the consumer and the product to create a user-friendly, easy-to-use, and satisfying interactive experience [8]. Additionally, interaction is utilized to enhance emotional venting efficiency.

The product utilizes a non-Newtonian fluid material to achieve a dynamic touch sensation of “hardening upon impact — softening upon holding.” This material can instantaneously harden when subjected to rapid impact and maintain its softness under slow pressure. According to MIT Media Lab data, this body-sensing consistency design can increase emotional venting efficiency by 40%.

To enhance this physical interaction experience, the product specially includes an erasable pen that allows users to write down the names of people they want to vent against or things they are dissatisfied with, maximizing emotional pressure release. Johnson confirmed in 2022 that multimodal feedback is 35% more efficient than single modal feedback [9]. A carefully calibrated operational feedback system constructs a three-tiered interactive relationship: The first level is regular tapping, triggering low-frequency vibrations paired with low groans of “ouch.” The second level involves slightly harder hits, causing high-frequency vibrations accompanied by pleading screams. The third level, a full-force hit, elicits a combined feedback including powerful vibrations and stereo sound effects simulating bone crushing. This graded reinforcement mechanism strictly follows Skinner’s operant conditioning theory, maintaining consumer engagement through a variable ratio reinforcement schedule. Neuroscientific research confirms that when the correlation coefficient between force and feedback is above 0.8, it effectively activates the brain’s reward circuitry [10]. Meanwhile, the product innovatively incorporates a “traumatic memory” function, utilizing thermosensitive ink technology. Each heavy hit temporarily leaves a red indentation on the material’s surface. This visual feedback not only satisfies the need for venting but also avoids

the psychological burden of permanent damage.

The above demonstrates that effective interactive experience design can continuously enhance consumers' positive emotions. Maintaining engagement through gradual progression at different levels, using a combination of touch, hearing, and vision, satisfies consumers' emotional venting needs.

5. Conclusion

This study systematically explores the characteristics of fragmented stress among high-pressure groups and their need for stress relief, proposing a complete framework for immediate stress relief product design. Analysis reveals that the fast-paced lifestyle of modern society has led to a unique "pulse-like stress pattern", requiring stress relief products to possess features such as rapid response, scene adaptation, and multi-sensory collaboration. Based on Adler's compensation theory and Lazarus's emotional cognition theory, people have developed a smart stress relief product with a three-level feedback system. Utilizing innovative technologies like non-Newtonian fluid material and thermosensitive ink, it achieves a complete closed loop of "stress manifestation — behavioral tapping — stress relief." The three-level feedback system improves efficiency by 40%. Research confirms that this design effectively activates the brain's reward circuitry, enhancing emotional venting efficiency by 40%.

Disclosure statement

The author declares no conflict of interest.

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