

# The role of scalp therapy in promoting psychological well-being and health promotion: A narrative review

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**Abstract-** This narrative review explored the psychophysiological mechanisms of scalp therapy and its potential role in promoting psychological well-being within integrative health medicine. The scalp is rich in blood vessels, sensory nerves, and hair follicles, making it highly responsive to external stimulation and closely linked to autonomic and emotional regulation. The literature suggests that scalp therapy may support autonomic nervous system balance, regulate stress responses through the hypothalamic–pituitary–adrenal (HPA) axis, and improve blood circulation. Tactile, olfactory, and thermal stimulation may promote relaxation, emotional stability, and stress reduction through interactions with the limbic system. As a non-invasive and accessible intervention, scalp therapy may benefit individuals experiencing chronic stress and contribute to wellness and preventive health programs, particularly when combined with complementary approaches such as aromatherapy and meditation. Further studies using standardized protocols and objective measures are needed to confirm its effectiveness and broader applicability.

**Keywords:** Scalp Therapy, Psychological Well-being, Stress Management, Wellness, Quality of Life, Integrative Health Medicine

## 1. INTRODUCTION

In recent years, health has increasingly been understood not merely as the absence of disease, but as an integrated state of psychological, physiological, and social adaptation. In this context, the interaction between stress and physiological responses has been emphasized as a key mechanism underlying overall health [1, 2]. Modern society, characterized by rapid industrialization and the expansion of digital environments, continuously exposes individuals to chronic stress, which has been identified as a major contributor to both physical and mental health problems. Stress disrupts autonomic nervous system balance and activates the hypothalamic–pituitary–adrenal (HPA) axis, resulting in increased cortisol secretion and suppression of immune function. These physiological changes directly influence skin and scalp health [3, 4]

The scalp is a highly vascularized and densely innervated area closely connected to the central nervous system, making it highly responsive to external stimulation. Scalp stimulation is transmitted to the brain through trigeminal and cervical nerves and may influence autonomic regulation and emotional stability [5]. Previous studies have reported that massage therapy induces positive physiological responses, including increased parasympathetic activity, reduced heart rate, and decreased stress hormone levels [6].

Based on these neurophysiological mechanisms, scalp therapy, particularly scalp massage, has been utilized as a non-invasive intervention promoting relaxation through improved blood circulation, muscle relaxation, and sensory stimulation. Park and Choi reported that the combined application of scalp serum and shampoo significantly improved hair thickness and scalp condition [7]. Koyama et al. also

suggested that scalp massage enhances perifollicular blood circulation and contributes to hair growth promotion and scalp condition improvement [8]. Furthermore, Kim et al. [9] reported that scalp stimulation positively affects psychological stress reduction and emotional stability.

Meanwhile, integrative health medicine has gained increasing attention as a holistic approach that considers the body, mind, and environment beyond disease-centered treatment. Complementary and alternative therapies such as massage, meditation, and aromatherapy have been actively incorporated into health management strategies [10]. Within this context, scalp therapy is emerging as an integrative intervention capable of improving both physical health and psychological stability.

However, previous studies have primarily focused on cosmetic effects or localized physiological changes associated with scalp therapy. Comprehensive reviews examining its psycho-physiological mechanisms and applicability from the perspective of integrative health medicine remain limited. Therefore, it is necessary to systematically organize the scientific evidence supporting scalp therapy and propose integrative health management strategies applicable to diverse populations.

From a social science perspective, scalp therapy may also be understood within the frameworks of the Biopsychosocial Model, Health Promotion Theory, and Quality of Life approaches. Beyond physiological responses, scalp therapy may contribute to stress management, psychological well-being, preventive health behaviors, and overall quality of life. As a non-invasive and accessible intervention, it may have potential applications in wellness promotion, workplace health programs, elderly care services, and community-based health management.

Accordingly, this study aimed to explore the psychophysiological mechanisms of scalp therapy and examine its potential role as an integrative health intervention for promoting psychological well-being, stress management, health promotion, and quality of life. To achieve this objective, previous studies related to autonomic nervous system regulation, stress responses, blood circulation, sensory stimulation, and emotional regulation were reviewed and analyzed from the perspective of integrative health medicine. Furthermore, this study seeks to provide a theoretical foundation for future clinical research and wellness-based applications of scalp therapy.

## **2. THEORETICAL BACKGROUND**

### **2.1 Definition of Scalp Therapy**

Scalp therapy is defined as an integrative management approach that applies mechanical stimulation, chemical treatment, and physiological regulation to maintain and improve scalp and hair health. Beyond the scope of conventional cosmetic care, scalp therapy has expanded as a complementary health intervention aimed at maintaining physiological balance of the scalp and promoting overall well-being [11].

The scalp is a complex tissue structure containing dense distributions of sebaceous glands, hair follicles, blood vessels, and sensory nerves. Compared with other body regions, the scalp has abundant blood circulation and highly developed sensory innervation, making it highly responsive to external stimulation. These anatomical and physiological characteristics provide an important basis for scalp therapy to induce not only localized effects but also systemic psycho-physiological responses [12].

### **2.2 Components of Scalp Therapy**

Scalp therapy generally consists of the following three core components.

#### **(1) Mechanical Stimulation**

Mechanical stimulation, including scalp massage, pressure, vibration, and brushing, increases local blood circulation, promotes muscle relaxation, and stimulates sensory nerves, thereby influencing autonomic nervous system regulation. In particular, massage stimulation has been reported to induce relaxation responses and reduce heart rate through parasympathetic nervous system activation [5].

#### **(2) Chemical and Biological Treatment**

Various products such as shampoos, ampoules, essences, and botanical extracts are used to regulate sebum balance, reduce inflammation, and provide antimicrobial effects on the scalp. Plant-derived essential oils and extracts may contribute to scalp condition improvement through anti-inflammatory and antioxidant effects [13].

#### **(3) Sensory Stimulation**

Sensory stimulation, including aroma, thermal, and tactile stimulation, affects the central nervous system and

promotes psychological stability and stress reduction. These sensory responses are closely associated with emotional regulation through activation of the limbic system [14].

### 2.3 Types of Scalp Therapy

Scalp therapy may be classified according to its purpose and application methods as follows.

#### (1) Cosmetic-oriented Scalp Therapy

This type primarily focuses on scalp cleansing, keratin removal, sebum regulation, and hair condition improvement, and is commonly performed in hair salons and scalp care clinics.

#### (2) Therapeutic Scalp Therapy

Therapeutic scalp therapy is aimed at improving specific scalp disorders such as hair loss, seborrheic dermatitis, and sensitive scalp conditions, often in combination with dermatological treatment [15].

#### (3) Wellness-integrated Scalp Therapy

This approach emphasizes stress reduction, emotional stabilization, and autonomic nervous system regulation through integration with massage, aromatherapy, color therapy, and other complementary therapies. Recently, its importance has been increasingly highlighted within integrative health medicine [16, 17, 7] and its applicability as a holistic mind–body management strategy has expanded.

### 2.4 Functional Roles of Scalp Therapy

Scalp therapy performs several important functional roles, including:

- Improvement of scalp blood circulation and oxygen supply
- Regulation of sebum and keratin for scalp condition improvement
- Promotion of hair growth through hair follicle stimulation
- Regulation of the autonomic nervous system through sensory nerve stimulation
- Reduction of stress and induction of psychological relaxation

In particular, long-term application of scalp massage has been reported to positively influence hair thickness and scalp elasticity [8].

### 2.5 Role in Integrative Health Medicine

As a non-invasive and non-pharmacological intervention, scalp therapy offers advantages in terms of safety, accessibility, and broad applicability. Within the framework of integrative health medicine, scalp therapy may contribute not only to physiological recovery but also to psychological well-being, stress management, and health promotion. From the perspective of the Biopsychosocial Model, scalp therapy may influence biological, psychological, and social dimensions of health simultaneously. Physiologically, scalp stimulation may support autonomic nervous system regulation and blood circulation. Psychologically, it may contribute to relaxation, emotional stabilization, and stress reduction. Socially, scalp therapy may encourage self-care behaviors and participation in wellness-oriented health promotion activities. In addition, Health Promotion Theory emphasizes the importance of preventive and self-directed health behaviors. In this context, scalp therapy may be regarded as a complementary health practice that supports preventive health management and wellness promotion. Furthermore, improved psychological well-being and stress management may positively influence quality of life, particularly among older adults, office workers, and individuals experiencing chronic stress. Therefore, scalp therapy may have potential applications in workplace wellness programs, community health promotion initiatives, elderly care services, and preventive health management strategies. As a complementary and accessible intervention, scalp therapy may contribute to the development of integrative approaches aimed at improving overall well-being and quality of life.

Massage-based interventions are particularly regarded as important elements in integrative treatment strategies because they may simultaneously support psychological stabilization and physiological recovery [5].

## 3. RESEARCH METHODOLOGY

### 3.1 Narrative Review Methodology

This study employed a narrative literature review methodology to examine the psychophysiological mechanisms of scalp therapy and explore its potential role in promoting psychological well-being, stress management, health promotion, and quality of life within the framework of integrative health medicine. Relevant literature was identified

and analyzed using both domestic and international academic databases.

The literature search was conducted using PubMed, Scopus, Google Scholar, ScienceDirect, and RISS. The search period was limited to studies published between 2010 and 2025. Major keywords included “scalp therapy,” “scalp massage,” “psychophysiology,” “autonomic nervous system,” “stress,” “HPA axis,” “hair loss,” “integrative health medicine,” “psychological well-being,” “quality of life,” “health promotion,” “aromatherapy,” “wellness,” and “complementary therapy.”

The inclusion criteria were as follows: (1) studies related to scalp therapy or massage interventions, (2) studies examining psychophysiological mechanisms such as autonomic nervous system regulation, stress responses, blood circulation, immune responses, and psychological outcomes, (3) studies associated with integrative health medicine, health promotion, wellness, or complementary and alternative therapies, and (4) peer-reviewed journal articles or reports published by credible institutions.

The exclusion criteria included: (1) non-academic or promotional materials, (2) studies lacking clear intervention methods or participant information, and (3) duplicated publications or abstract-only materials.

Based on the selected literature, this study comprehensively reviewed the effects of scalp therapy on autonomic nervous system regulation, stress hormone responses, blood circulation, immune responses, sensory stimulation, emotional regulation, psychological well-being, and quality of life. Furthermore, the applicability of scalp therapy in integrative health medicine, wellness promotion, and preventive health management was discussed.

This study was based exclusively on previously published literature and did not involve human participants or personal data collection. Therefore, ethical approval was not required.

## **4. RESULTS AND DISCUSSION**

Scalp therapy may be understood as an integrative intervention that extends beyond simple physical stimulation and influences the nervous, endocrine, and circulatory systems, thereby promoting psychological stability and physiological balance. This section reviews the major mechanisms of scalp therapy, focusing on autonomic nervous system regulation, stress hormones and the HPA axis, blood circulation and microcirculation, immune and inflammatory responses, and brain–psychological responses.

### **4.1 Autonomic Nervous System Regulation**

The autonomic nervous system (ANS) consists of the sympathetic and parasympathetic nervous systems. Sympathetic activity predominates during stress, whereas parasympathetic activity is associated with relaxation. Scalp therapy, particularly massage stimulation, activates sensory nerves through mechanoreceptors, and these signals are transmitted to the central nervous system, contributing to autonomic nervous system regulation.

Recent studies have shown that massage before bedtime significantly improves sleep efficiency while reducing stress levels, suggesting close associations with nervous system stabilization and physiological recovery [16]. Regular tactile stimulation has also been reported to increase parasympathetic activity, reduce heart rate, and improve heart rate variability (HRV), thereby enhancing autonomic stability [2, 5]. These effects may be amplified in highly innervated areas such as the scalp.

### **4.2 Stress Hormones and HPA Axis Regulation**

Stress activates the hypothalamic–pituitary–adrenal (HPA) axis, increasing cortisol secretion and contributing to long-term immune suppression and inflammatory responses [18]. Scalp therapy may help alleviate these stress-related responses. Massage and tactile stimulation have been associated with reduced cortisol levels and increased secretion of positive neurotransmitters such as serotonin and dopamine [3]. In addition, relaxation therapy has been linked to decreased norepinephrine levels, contributing to psychological stabilization and stress reduction [19].

### **4.3 Improvement of Blood Circulation and Microcirculation**

The scalp is densely populated with hair follicles and sebaceous glands, and blood circulation plays an important role in hair growth and scalp health. Mechanical stimulation such as scalp massage promotes local vasodilation, thereby increasing blood flow and improving oxygen and nutrient supply.

Recent studies have reported that combined application of scalp care products and therapy improves scalp elasticity, hair thickness, and hair density [20]. Koyama et al. [8] observed increased hair thickness following continuous scalp massage and suggested that this effect may be associated with activation of dermal papilla cells induced by mechanical stimulation. Increased circulation may also facilitate the removal of inflammatory substances and

metabolic waste, thereby improving scalp conditions.

#### 4.4 Regulation of Immune and Inflammatory Responses

Stress is a major factor contributing to immune dysfunction and exacerbation of inflammatory skin and scalp conditions. Through regulation of the autonomic nervous system and endocrine responses, scalp therapy may indirectly influence immune function.

Neuroimmunological studies have suggested that stress reduction is associated with decreased inflammatory cytokine activity, which may positively affect scalp disorders such as seborrheic dermatitis and hair loss [8]. Tactile stimulation has also been reported to increase oxytocin secretion, contributing to anti-stress and anti-inflammatory effects [4].

#### 4.5 Sensory Stimulation and Brain–Psychological Responses

Scalp therapy includes various forms of sensory stimulation such as tactile, thermal, and olfactory stimulation. These stimuli influence the limbic system and prefrontal cortex, thereby modulating emotional responses.

Tactile-based massage therapy has been associated with reduced anxiety and improved mood, potentially through increased serotonin activity [21]. Aromatherapy stimulation is also known to directly affect the limbic system through olfactory pathways, influencing memory, emotions, and stress responses [5].

#### 4.6 Integrated Mechanisms of Action

The effects of scalp therapy arise not from a single mechanism but from multiple interacting pathways, including:

- Sensory stimulation → Neural transmission → Autonomic nervous system regulation
- Autonomic regulation → HPA axis suppression → Reduction of stress hormones
- Increased circulation → Enhanced tissue metabolism → Improved scalp environment
- Psychological stabilization → Immune recovery → Reduced inflammatory responses [15].

These complex interactions suggest that scalp therapy may contribute to both physiological regulation and psychological well-being. From the perspective of integrative health medicine, scalp therapy may support stress management, wellness promotion, and quality of life improvement. Therefore, scalp therapy should be considered not only as a cosmetic care practice but also as a potential complementary intervention for preventive health management and holistic well-being.

#### 4.7 Research Model

The proposed research model illustrates the potential pathways through which scalp therapy may influence psychophysiological health outcomes. Sensory stimulation generated during scalp therapy may affect autonomic nervous system regulation, HPA axis activity, blood circulation, immune responses, and brain–psychological processes. These interconnected mechanisms may contribute to stress reduction, psychological well-being, physiological recovery, scalp and hair health, and overall quality of life. From a social science perspective, the model also suggests that scalp therapy may support health promotion and wellness by enhancing emotional stability and preventive health behaviors. Therefore, the proposed model integrates both physiological and psychosocial dimensions of health within the framework of integrative health medicine.

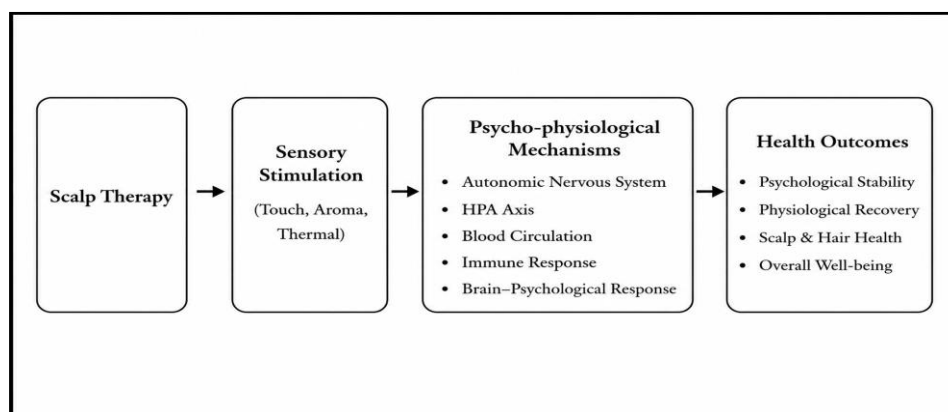


Figure 1. Conceptual Model of Scalp Therapy and Its Psychophysiological Mechanisms

This figure presents a conceptual model proposed by the authors based on findings from the reviewed literature.

## **5. APPLICABILITY IN INTEGRATIVE HEALTH MEDICINE**

### **5.1 Role of Scalp Therapy in Integrative Health Medicine**

Integrative health medicine is defined as a healthcare approach that considers the body, mind, and environment beyond disease-centered treatment [22]. From this perspective, scalp therapy possesses several important characteristics:

- Non-pharmacological intervention
- Low risk of side effects and high accessibility
- Simultaneous improvement of psychological and physiological functions
- Compatibility with various therapeutic approaches

Massage-based interventions have been reported to be effective in stress reduction and autonomic nervous system stabilization, making them important components of integrative health management strategies [23].

### **5.2 Application for Older Adults**

Older adults frequently experience physical decline, psychological isolation, depression, and increased stress, highlighting the importance of non-pharmacological interventions.

Potential benefits of scalp therapy for older adults include:

- Promotion of psychological stability and emotional support
- Enhancement of scalp and systemic circulation through improved blood flow
- Cognitive stimulation through tactile sensory input
- Increased social interaction

Tactile stimulation has been reported to increase oxytocin secretion, thereby promoting emotional stability and trust formation [5]. Therefore, scalp therapy may serve as an effective intervention in nursing facilities and senior wellness programs.

### **5.3 Application for Office Workers and High-stress Populations**

Modern office workers are frequently exposed to occupational stress, sleep deprivation, and psychological tension, which may contribute to autonomic nervous system imbalance. These conditions are also closely associated with scalp-related problems such as hair loss and seborrheic dermatitis.

The major effects of scalp therapy in high-stress populations may include:

- Reduction of stress hormones
- Relief of muscle tension and psychological stabilization
- Prevention of hair loss through improved scalp circulation
- Improvement of sleep quality

Massage and relaxation therapies have been reported to reduce anxiety and improve mood, suggesting their usefulness in workplace stress management programs [21, 6].

### **5.4 Application for Hair Loss and Scalp Disorders**

Hair loss is not merely a cosmetic issue but a multifactorial condition closely associated with psychological stress. Stress may alter the hair growth cycle and contribute to telogen effluvium [12].

Scalp therapy may serve the following supportive roles:

- Improvement of perifollicular blood circulation
- Reduction of scalp inflammation
- Regulation of sebum and keratin
- Reduction of psychological stress

Combined application of scalp massage and scalp care products has been reported to positively affect hair thickness and scalp condition improvement [12, 7, 8].

### 5.5 Proposal of an Integrated Program Model

Scalp therapy may be implemented not only as a standalone intervention but also as part of an integrated program combined with various complementary therapies [7].

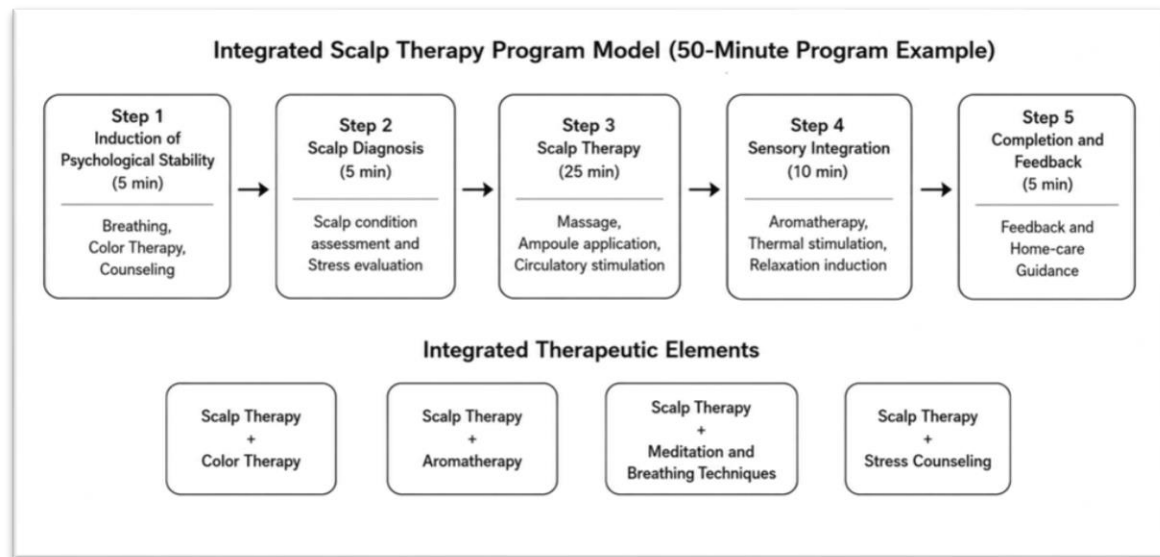


Figure 2. Integrated Scalp Therapy Program Model

Figure 2 represents a conceptual program model proposed by the authors based on findings from the reviewed literature. It is intended to provide a practical framework for integrating scalp therapy with complementary approaches such as color therapy, aromatherapy, meditation, breathing techniques, and stress counseling within wellness and health promotion programs.

This model presents an example of an integrated program structured around scalp therapy, incorporating psychological stabilization, scalp diagnosis, sensory stimulation, and post-care management. The program consists of a 50-minute session. In the initial stage, breathing exercises, color therapy, and counseling are used to induce psychological relaxation. This is followed by assessment of scalp condition and stress levels, after which scalp therapy focusing on massage and circulatory stimulation is applied. Sensory integration involving aroma and thermal stimulation is then introduced to enhance relaxation responses, and the final stage provides feedback and home-care guidance.

In particular, this model integrates scalp therapy with color therapy, aromatherapy, meditation and breathing techniques, and stress counseling. Through this integrative approach, the model aims to simultaneously promote psychological stability and physiological recovery within the framework of integrative health medicine.

#### (1) Basic Structure of the Program (50-minute Example)

Step 1. Psychological Stabilization (5 min)→ Breathing exercises, color therapy, counseling

Step 2. Scalp Diagnosis (5 min)→ Scalp condition and stress assessment

Step 3. Scalp Therapy (25 min)→ Massage, ampoule treatment, circulatory stimulation

Step 4. Sensory Integration (10 min)→ Aroma, thermal stimulation, relaxation induction

Step 5. Feedback and Post-care (5 min)→ Feedback and home-care guidance

#### (2) Integrated Therapeutic Elements

- Scalp therapy + Color therapy
- Scalp therapy + Aromatherapy
- Scalp therapy + Meditation and breathing techniques
- Scalp therapy + Stress counseling

Such integrative approaches may simultaneously enhance sensory stimulation and emotional regulation, thereby promoting greater psychological stability and physiological recovery [24, 25].

## **5.6 Clinical and Industrial Applicability**

Scalp therapy may be utilized in various clinical and industrial fields, including:

- Supportive treatment in hospitals and clinics
- Workplace stress management programs
- Nursing facilities and senior care services
- Beauty and healthcare industries
- The global wellness market

Because scalp therapy is non-invasive and can be standardized as a service, it is considered a highly expandable intervention with strong clinical and industrial potential. With further standardization of service protocols and additional clinical validation, scalp therapy is expected to play an increasingly important role in integrative health medicine and the wellness industry.

## **6. LIMITATIONS AND FUTURE RESEARCH DIRECTIONS**

### **6.1 Limitations of the Study**

Although this study provides a comprehensive review of the psychophysiological mechanisms of scalp therapy and its potential applicability in integrative health medicine, several limitations should be acknowledged.

First, high-quality randomized controlled trials (RCTs) specifically focused on scalp therapy remain limited. Furthermore, many previous studies have examined general massage interventions, making it difficult to isolate the independent effects of scalp therapy [25].

Second, the lack of standardized intervention protocols regarding treatment duration, intensity, frequency, and product use limits the comparability and generalizability of findings. In addition, practitioner expertise and environmental factors may influence therapeutic outcomes.

Third, assessments of psychological outcomes have primarily relied on subjective self-report measures. Objective evaluations using physiological indicators such as heart rate variability (HRV), cortisol levels, and other biomarkers remain insufficient [24].

Fourth, limited evidence is available regarding the long-term effects of scalp therapy. Longitudinal studies are needed to determine whether observed benefits can be maintained over time and whether cumulative effects exist.

Finally, the current evidence base remains largely focused on physiological outcomes. Additional research is needed to examine the potential effects of scalp therapy on psychological well-being, quality of life, wellness, and health-promoting behaviors.

### **6.2 Future Research Directions**

Future studies should consider the following directions.

First, standardized scalp therapy protocols should be developed and validated through randomized controlled trials (RCTs). Treatment duration, pressure, frequency, treatment area, and product use should be systematically defined to establish reproducible intervention models.

Second, future research should incorporate objective physiological measurements, including HRV, electroencephalography (EEG), scalp temperature, skin temperature, blood flow analysis, and cortisol biomarkers, to better understand the psychophysiological effects of scalp therapy.

Third, population-specific intervention studies should be conducted among older adults, office workers, individuals experiencing chronic stress, and patients with hair loss or scalp disorders. These studies may provide valuable evidence regarding practical applicability and health outcomes.

Fourth, comparative and integrative studies examining scalp therapy combined with complementary interventions such as color therapy, aromatherapy, meditation, and breathing techniques are needed. Such approaches may contribute to the development of evidence-based integrative health and wellness models.

Fifth, future studies should investigate the effects of scalp therapy on psychological well-being, quality of life, stress management, and preventive health behaviors using validated social and behavioral health measures.

Finally, the development of data-driven personalized scalp care systems should be explored. Integration with digital healthcare technologies may contribute to emerging fields of personalized wellness management and preventive health promotion.



## 7. CONCLUSION

This study reviewed the psychophysiological mechanisms of scalp therapy and explored its potential applicability within the framework of integrative health medicine through a narrative literature review. The reviewed evidence suggests that scalp therapy may influence autonomic nervous system regulation, stress-related physiological responses, blood circulation, and immune function through sensory stimulation. These responses may contribute to psychological stabilization, stress management, and improvements in scalp and hair health.

As a non-invasive and accessible intervention, scalp therapy may have potential applicability for various populations, including older adults, office workers, and individuals experiencing chronic stress. Furthermore, when integrated with complementary approaches such as color therapy, aromatherapy, meditation, and breathing techniques, scalp therapy may support psychological well-being, wellness promotion, and preventive health management.

However, the current evidence remains limited by the lack of standardized intervention protocols, insufficient objective physiological assessments, and a shortage of long-term studies. Therefore, further research employing rigorous study designs, including randomized controlled trials and longitudinal studies, is needed to establish its effectiveness and broader applicability.

In conclusion, scalp therapy may serve as a promising complementary approach for psychological well-being, stress management, health promotion, and quality of life. Beyond conventional cosmetic care, it has potential value within integrative health medicine, wellness programs, and preventive health management. Future research is required to strengthen the evidence base and support its practical implementation in clinical, community, and wellness settings.

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