UDC 618.1:616.858.036.865:615.36:61(73)

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Apitherapy within the apitherapy pyramid: the use of the bee therapy bed as an innovative adjunctive method for correcting female health disorders in the US integrative medicine system

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Ukrainian Journal Health of Woman. 2026. 2(183): 46-53; doi: 10.15574/HW.2026.2(183).4653

For citation: Olshansky AI. (2026). Apitherapy within the apitherapy pyramid: the use of the bee therapy bed as an innovative adjunctive method for correcting female health disorders in the US integrative medicine system. Ukrainian Journal Health of Woman. 2(183): 46-53. doi: 10.15574/HW.2026.2(183).4653

In modern medical science, methods of integrative and complementary medicine aimed at supporting the body's natural self-regulatory mechanisms are receiving increasing attention. Such approaches are of particular importance in the field of women's health, where psycho-emotional factors, hormonal balance and neurovegetative regulation play a key role in maintaining physiological equilibrium.

Aim – to develop a conceptual model of apitherapy using a bee therapy bed as an auxiliary innovative method for managing women's health disorders using the example of integrative medicine in the USA.

Materials and methods. An organizational and analytical study was conducted using a systems analysis of available literature, the existing system of integrative medicine, wellness therapy, and natural health restoration methods in the USA, and the integration of predictors into medical practice.

Results. Apitherapy (the therapeutic use of bee products and biological factors associated with the life of the bee colony) is now regarded as a promising field of natural medicine. Within the framework of modern apitherapy, the concept of the apitherapeutic pyramid is taking shape, combining various levels of therapeutic influence: from the use of biologically active bee products to the creation of a specialized therapeutic environment. This article presents the author's concept of the apitherapeutic pyramid utilizing a bee therapy bed, developed by Anatoliy Olshansky, and analyses its potential as an adjunctive method for correcting functional disorders of women's health. Particular attention is paid to the innovative nature of the multisensory effects of biological factors from the bee colony, which may contribute to the normalization of neuroendocrine regulation, a reduction in stress levels, and an improvement in a woman's psychophysiological state.

Conclusions. The use of this technology can be considered as an auxiliary method for maintaining women's health, aimed at improving psycho-emotional state, normalizing neurovegetative regulation, and increasing the body's adaptive potential.

The author declares no conflict of interest.

Keywords: apitherapy, integrative medicine, bee therapy bed, apitherapeutic pyramid, women's health, neurovegetative regulation, natural medicine.

Апітерапія в апітерапевтичній піраміді з використанням бджолиного лікувального ліжка як допоміжного інноваційного методу корекції порушень жіночого здоров'я в системі інтегративної медицини США

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У сучасній медичній науці дедалі більшої уваги набувають методи інтегративної та комплементарної медицини, спрямовані на підтримку природних механізмів саморегуляції організму. Особливого значення такі підходи набувають у сфері жіночого здоров'я, де психоемоційні фактори, гормональний баланс та нейровегетативна регуляція відіграють ключову роль у підтримці фізіологічної рівноваги.

Мета – розробити концепційну модель апітерапії з використанням бджолиного лікувального ліжка як допоміжного інноваційного методу корекції порушень жіночого здоров'я на прикладі інтегративної медицини США.

Матеріали і методи. Проведено організаційно-аналітичне дослідження з використанням системного аналізу наявних літературних даних, існуючої системи інтегративної медицини, wellness-терапії та природних методів відновлення здоров'я у США, інтеграції предикторів у медичну практику.

Результати. Апітерапія (лікувальне застосування продуктів бджільництва та біологічних факторів життєдіяльності бджолиної сім'ї) розглядається сьогодні як перспективний напрям природної медицини. У межах сучасної апітерапії формується концепція апітерапевтичної піраміди, що поєднує різні рівні терапевтичного впливу: від використання біологічно активних продуктів бджільництва до створення спеціалізованого терапевтичного середовища. Представлено авторську концепцію апітерапевтичної піраміди з використанням ліжка для бджолотерапії, розробленої Анатолієм Ольшанським, та проаналізовано її потенціал як допоміжний метод корекції функціональних розладів жіночого здоров'я. Особлива увага приділяється інноваційності мультисенсорного впливу біологічних факторів бджолиної сім'ї, які можуть сприяти нормалізації нейроендокринної регуляції, зниженню рівня стресу та покращенню психофізіологічного стану жінки.

Висновок. Застосування цієї технології може розглядатися як допоміжний метод підтримки жіночого здоров'я, спрямований на покращення психоемоційного стану, нормалізацію нейровегетативної регуляції та підвищення адаптаційного потенціалу організму.

Автор заявляє про відсутність конфлікту інтересів.

Ключові слова: апітерапія, інтегративна медицина, бджолине лікувальне ліжко, апітерапевтична піраміда, жіноче здоров'я, нейровегетативна регуляція, природна медицина.

Women's health is a multidimensional concept encompassing physiological, hormonal, psychological and social aspects. In today's lifestyle, characterised by high levels of stress, urbanization, information overload and increasing chronic psycho-emotional strain, more and more women are experiencing functional disorders linked to disturbances in the body's neuroendocrine regulation [1,4,12,27].

The most common of these conditions include:

- chronic fatigue;
- sleep disturbances;
- emotional instability;
- autonomic dysfunction;
- hormonal fluctuations;
- psycho-emotional disorders associated with the perimenopausal period [1,4,5,12,27].

Aim – to develop a conceptual model of apitherapy using a bee therapy bed as an auxiliary innovative method for managing women's health disorders using the example of integrative medicine in the USA.

Materials and methods of the study

An organizational and analytical study was conducted using a systems analysis of available literature, the existing system of integrative medicine, wellness therapy, and natural health restoration methods in the USA, and the integration of predictors into medical practice.

Results of the study and discussion

In this context, the field of integrative medicine is rapidly developing within medical practice, combining traditional clinical approaches with natural therapeutic methods [11,23,24,30].

One such field is apitherapy – the use of bee products and the biological factors associated with the life processes of the bee colony for therapeutic and preventive purposes. The American Apitherapy Society plays a significant role in the popularisation and development of modern apitherapy technologies, promoting scientific research into the therapeutic properties of bee products [8,9,15,19,20,25].

As part of the development of this field, a new concept of nature-oriented therapy is emerging – the apitherapy pyramid, which combines biological, ecological, and architectural-spatial factors of therapeutic influence [2,3,6,7,15,19,20,22].

One of the most innovative elements of this concept is the bee therapy bed, situated within a specially designed pyramidal therapeutic structure [8,9,15,22–24].

The concept of the apitherapeutic pyramid. The original concept of the apitherapeutic pyramid, proposed by author, is based on the idea of a multi-level therapeutic effect of factors from the bee colony on the human body (Fig. 1). In this concept, apitherapy is viewed not only as the use of bee products, but also as the creation of a holistic biotherapeutic environment that activates the body's natural recovery mechanisms [11,23,24,30].

The apitherapeutic pyramid comprises several levels (Table 1).

Level 1. Biological bee products. The foundation of apitherapy lies in bee products that possess pronounced biologically active properties:

- honey;
- propolis;
- royal jelly;
- bee pollen;
- bee bread;
- beeswax;
- bee venom [8–10,15,16,18–21,25,26,28].

These products are characterised by antibacterial, anti-inflammatory, antioxidant and immunomodulatory properties, which are extensively studied in modern biomedical science [10,15,18–21,25,26,28].

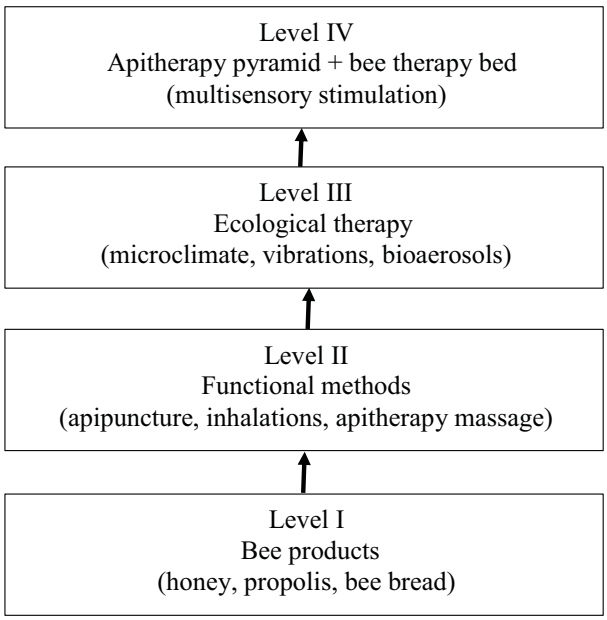

Fig. 1. Apitherapeutic pyramid (conceptual model)

Table 1

Levels of the apitherapy pyramid and their functions

Level	Components	Main mechanism of action	Potential effect
I	Honey, propolis, royal jelly	Biochemical	Immunomodulation, antioxidant effect
II	Apipuncture, inhalations	Reflex, local	Anti-inflammatory, analgesic
III	Microclimate, vibrations, aerosols	Biophysical	Relaxation, normalization of the autonomic nervous system (ANS)
IV	Pyramid + bee therapy bed	Multisensory	Systemic regulation, anti-stress

Level 2. Functional apitherapy methods. At this level, therapeutic methods are applied that utilise the direct effect of bee products on the body:

- apipuncture (treatment with bee venom);
- inhalation apitherapy;
- api-phytotherapy;
- use of apicosmetics;
- apitherapy massage [8,9,15,19,20,25].

Level 3. Ecological therapy of the bee colony. At this level, the biophysical factors of the bees' vital activity are utilised:

- beehive microclimate;
- thermal radiation of the bee colony;
- microvibrations of the bees' wings;
- aromatic substances in honey, wax and propolis;
- bioaerosols in the hive air.

It is these factors that create a natural therapeutic environment [2,6,7,15,19–22].

Level 4.The apitherapy pyramid and the bee therapy bed.

The most innovative aspect is the creation of an architectural and biotherapeutic space that combines the natural biophysical factors of a bee colony with the geometric harmony of a pyramidal structure.

This structure houses a therapeutic bee therapy bed, beneath which are specially insulated hives containing bee colonies [8,15,22].

The patient lies above the hives, receiving a comprehensive multisensory experience that includes:

- gentle vibrations;
- the warmth of the bee colony;
- natural aromatic compounds;
- the specific microclimate of the hive [2,3,6,7,15,19,20,22].

On average, an apitherapy pyramid can house up to 400–450 thousand bees, creating a stable bioenergetic environment.

Biophysical mechanisms of the therapeutic effects of the apitherapy environment. The potential therapeutic effect of the apitherapy pyramid, utilising a therapeutic bee therapy bed, can be explained by a combination of biophysical, biochemical, and psychophysiological factors. Unlike traditional forms of apitherapy, which are based primarily on the use of bee products, this system involves the use of the holistic natural bioecological environment of the bee colony [1,2,4,11,12,22–24,27].

A bee colony is a complex biological system that functions as a self-regulating bioenergetic complex.

In the course of their life activities, bees create a stable microenvironment characterised by specific physical parameters: temperature, humidity, acoustic vibrations, microvibrations, and the saturation of the air with volatile biologically active substances [19–21].

It is the combination of these factors that creates a unique therapeutic environment capable of influencing the human nervous system, its psycho-emotional state and overall physiological balance [15,17,19–21,25].

Within the framework of the modern concept of integrative medicine, such natural biophysical influences are regarded as gentle regulatory stimuli that can contribute to the normalization of the body's functional processes (Table 2).

The microvibrational effects of a bee colony. One of the most characteristic physical factors associated with the life of a bee colony is the constant microvibrational oscillations that arise from the bees' wing movements and their communicative behaviour within the hive.

During flight and hive ventilation, bees make rapid wing movements, the frequency of which can reach approximately 200–300 Hz. These vibrations create a complex acoustic-vibrational background that propagates through the hive walls and can be transmitted through the structure of the apitherapy lounger [3,6,7].

Microvibrations of this type belong to low-amplitude mechanical oscillations and can be perceived by mechanoreceptors in human skin. It is known that

Table 2

Biophysical factors and their effects on the body

Factor	Source	Physiological mechanism	Effect
Microvibrations (200–300 Hz)	Bee wings	Activation of mechanoreceptors	Relaxation, stress reduction
Heat (34–35°C)	Bee colony	Vasodilation	Improved blood circulation
Propolis bioaerosols	Beehive	Antimicrobial effect	Clearing of the respiratory tract
Aromas	Honey, wax, propolis	Effect on the limbic system	Anxiolytic effect

such mechanical stimuli are capable of activating receptors of tactile and proprioceptive sensitivity, which, in turn, influence the functioning of the central nervous system.

From a neurophysiological perspective, rhythmic vibrational stimuli can contribute to the activation of sensory relaxation mechanisms and the induction of a state of deep physiological relaxation. A similar effect is described in studies on the use of vibroacoustic therapy, which is employed to reduce stress levels and normalize the psycho-emotional state.

In the context of apitherapy, the microvibrations of a bee colony form a natural bioacoustic field, which can affect the human body much more gently and naturally than artificially created vibrational systems.

The microclimate of the beehive. Another important factor in the apitherapeutic environment is the specific microclimate maintained inside the beehive [1,3,6,7,12].

A bee colony is capable of maintaining extremely stable temperature and humidity levels within the hive, which are essential for brood development. The temperature at the centre of the hive is usually around 34–35°C and is maintained by the bees through complex thermoregulatory mechanisms.

This stability is achieved through the bees' collective behaviour: they can cluster together in tight groups to conserve heat or, conversely, actively ventilate the hive by flapping their wings to lower the temperature [1,4,12,27].

For humans, spending time in such a warm and stable environment can have a pronounced relaxing effect. Moderate heat promotes muscle relaxation, improves peripheral blood circulation and reduces tension in the ANS [1,4,12,27].

Furthermore, temperature stability creates a sense of comfort and security, which is an important factor in psycho-emotional relaxation [11,23,24].

In the context of women's health, such gentle thermal stimulation can be particularly significant, as heat can positively influence blood circulation in the pelvic region, help relax smooth muscles and improve overall well-being (Fig. 2).

Bioaerosols of propolis and other bee products. A bee colony actively uses propolis to protect its hive from microorganisms. Propolis is a complex natural substance containing dozens of biologically active components of plant origin, including flavonoids, phenolic acids, and aromatic compounds [6,7,21].

Under natural conditions, propolis gradually releases volatile biologically active substances that permeate the air inside the hive. This creates a unique bioaerosol containing microconcentrations of natural antimicrobial components [1,3,6,7,12].

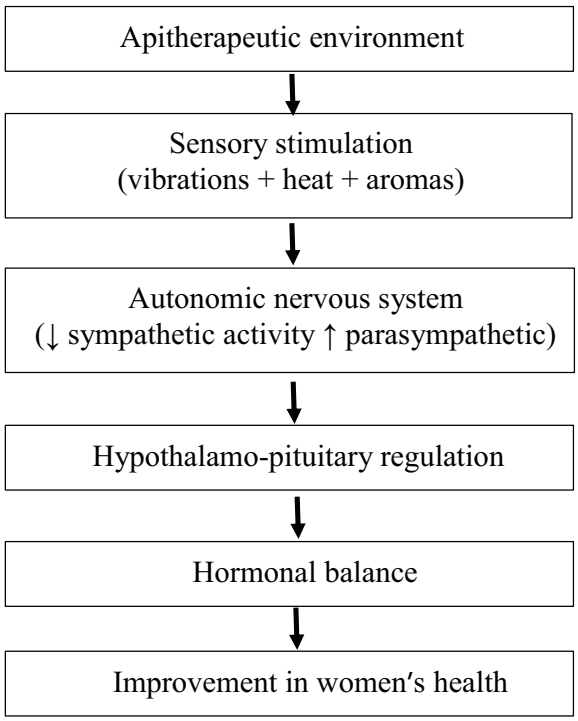

Fig. 2. Mechanism of effect on women's health

Table 3

Effects on the neuroendocrine system

Level of effect	Mechanism	Result
Psycho-emotional	Reduction in cortisol	Anti-stress
Nervous system	Activation of the parasympathetic nervous system	Relaxation
Endocrine	Regulation of GnRH (Gonadotropin-releasing hormone)	Cycle stabilization
Circadian	Improved sleep	Melatonin balance

Scientific studies show that propolis has pronounced antibacterial, antifungal and antiviral properties. It is thanks to these properties that the bee colony is able to maintain a high level of hygiene in its hive [1,4,5,12,27].

For humans, spending time in such an environment can create the effect of natural inhalation apitherapy. Inhaling microconcentrations of propolis's aromatic components can help clear the airways, reduce bacterial load and improve general well-being [1,4,5,12,27].

The aromatherapeutic effect of the apitherapeutic environment. Another important component of the apitherapeutic effect is the aromatic complex formed within the beehive environment (Table 3).

The scents of honey, beeswax, propolis, and other bee products form a complex composition of natural aromatic substances. These aromas are not only pleasant to the senses but are also capable of influencing the brain's limbic system, which is responsible for emotions, memory and stress responses [1,4,12].

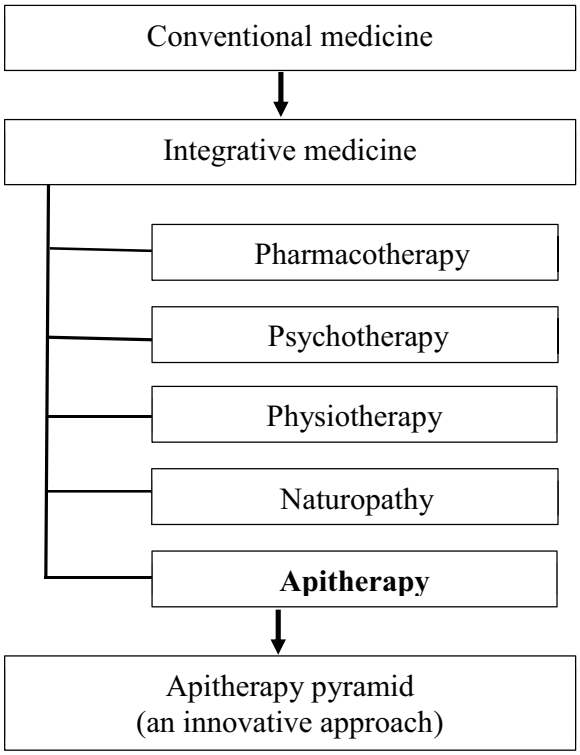

Fig. 3. Place in integrative medicine in the USA

It is well known that aromatic substances can stimulate the receptors of the olfactory system, signals from which are transmitted directly to the brain structures involved in regulating emotional states. This is precisely why aromatherapy is widely used in psychophysiological rehabilitation.

In the case of an apitherapeutic environment, the aromatic effect is of natural origin and is created without the use of synthetic components.

For women who often experience significant psychological and emotional stress, such a natural aromatherapeutic environment can help reduce anxiety levels, improve mood and foster a sense of psychological comfort.

In today's world, an increasing number of factors are capable of disrupting this complex regulatory system. Chronic psychological and emotional stress, disruptions to circadian rhythms, excessive information overload, environmental factors, and a decline in physical activity lead to an imbalance in neuroendocrine mechanisms. Such disturbances can result in functional disorders of the menstrual cycle, premenstrual syndrome, chronic fatigue, sleep disturbances, reduced libido, and other manifestations of neuroendocrine maladaptation [1,4,12,27].

In the context of integrative medicine, increasing attention is being paid to natural regulatory factors capable of gently influencing the neuroendocrine system and helping to restore its balance. It is precisely these factors that include the natural biophysical and biochemical influences formed within the bee colony environment and utilised in apitherapy practices [1–4,6,7,22].

According to current understanding, the potential influence of the apitherapeutic environment on a woman's hormonal balance may be realised through several interrelated mechanisms [1,4,11,23].

Table 4

Comparison with other methods of integrative medicine

Method	Type of effect	Level of systematicity	Characteristic
Meditation	Psycho-emotional	Moderate	Self-regulation
Aromatherapy	Sensory	Local	Scents
Vibroacoustic therapy	Physical	Medium	Artificial vibrations
Apitherapy pyramid	Comprehensive	High	Natural synergy

Neuroendocrine regulation via relaxation mechanisms (Table 4). One of the key factors in hormonal imbalance in women is chronic stress. Prolonged psycho-emotional strain activates the hypothalamic-pituitary-adrenal axis, leading to increased secretion of cortisol – the so-called stress hormone [1,4,12].

Elevated cortisol levels can adversely affect hypothalamic function and inhibit the normal secretion of GnRH. This, in turn, leads to changes in the secretion of luteinising and follicle-stimulating hormones, which directly influence ovarian function.

An apitherapy environment, which combines microvibrational stimuli, the warmth of the bee colony and natural aromatic components, can create conditions for deep psychophysiological relaxation. Reduced stress levels help to normalize the activity of the hypothalamic-pituitary system and restore the natural hormonal rhythm [2,3,6,7,22].

A similar mechanism is widely described in studies on the effects of meditative and relaxation practices on the neuroendocrine system [1,4,12,27].

Effect on the ANS. The ANS plays a vital role in regulating hormonal processes. It controls the activity of internal organs, regulates blood circulation, metabolism, and the functioning of the endocrine glands [1,4,12,27].

A predominance of sympathetic nervous activity, characteristic of a state of chronic stress, can contribute to hormonal imbalances. Conversely, activation of the parasympathetic system is associated with a state of recovery, relaxation, and stabilization of physiological processes [10,15,16,18–20,25,26,28].

The rhythmic microvibrations of the bee colony, the thermal comfort and the aromatic background of the apitherapy environment can stimulate parasympathetic activity, which helps to normalize the functioning of the endocrine system [15,16,18,25].

Effects on circadian rhythms. A woman's endocrine system is closely linked to the body's natural biological rhythms. Disruptions to circadian rhythms, particularly the sleep-wake cycle, can lead to significant changes in hormone secretion [1,4,12,27].

Melatonin, which is synthesized by the pineal gland, plays an important role in regulating the reproductive system. It influences the function of the hypothalamus and can modulate the activity of gonadotropic hormones [12,27].

The favourable sensory environment created within the apitherapy pyramid can positively influence sleep quality and the restoration of natural circadian rhythms. This, in turn, can contribute to the stabilization of hormonal regulation.

Biochemical effects of bee products. As part of comprehensive apitherapy, alongside the influence of biophysical factors, bee products containing numerous biologically active substances are frequently used [1,4,12,27].

Honey, propolis, bee bread and royal jelly contain antioxidants, amino acids, trace elements and natural enzymes that can support metabolic processes and overall physiological balance [10,15,16,18, 20,25,26,28].

Royal jelly, in particular, contains unique biologically active compounds that are being studied in the context of their potential impact on the endocrine system [10,15,16,18].

Psycho-emotional stabilization. A woman's emotional state is directly linked to hormonal regulation. Anxiety, depressive states and psycho-emotional instability can significantly affect the function of the hypothalamic-pituitary system [1,4,12,27].

Spending time in a natural apitherapeutic environment, which combines contact with nature, rhythmic bioacoustic vibrations and natural aromas, can help foster a sense of psychological well-being [2,3,6,7,22].

In many cases, it is precisely this psycho-emotional stabilization that becomes a key factor in restoring hormonal balance.

Significance for women's health. The female body is characterised by high sensitivity to psycho-emotional and hormonal changes.

Table 5

Potential clinical effects

Condition	Potential effect
Chronic stress	Reduction in cortisol
Sleep disturbance	Normalization of rhythms
Premenstrual syndrome (PMS)	Stabilization of emotions
Autonomic dysfunction	Balance of the ANS
Perimenopause	Support for adaptation

Functional disorders in women's health are often associated with:

- chronic stress;
- sleep disturbances;
- neurovegetative dysfunction;
- hormonal imbalance.

In this context, the apitherapy pyramid can be regarded as a complementary natural method for supporting a woman's psychophysiological balance [1,4,12,27].

In particular, the potential effects include (Table 5):

– reduced stress levels;
– improved sleep quality;
– normalization of autonomic regulation;
– enhanced adaptive capacity.

Prospects for use in the USA. In the USA, the market for integrative medicine, wellness therapy and natural health restoration methods is developing rapidly.

The following organisations play a significant role in promoting apitherapy:

- American Apitherapy Society;
- National Center for Complementary and Integrative Health.

Apitherapy centres are being established in many states, where the following are used: apidomes, inhalation apitherapy systems, and bee loungers.

In this context, the apitherapy pyramid can be viewed as an innovative direction in the development of natural therapy, combining the traditions of apitherapy with modern concepts of biodesign and ecotherapy.

Prospects for further research. Despite growing interest in apitherapy, scientific research into the mechanisms by which it affects the female hormonal system is still in its infancy.

Further clinical and experimental studies could focus on investigating changes in hormone levels, indicators of autonomic regulation, stress markers, and other physiological parameters under the influence of an apitherapeutic environment.

Studying these processes will allow for a clearer definition of apitherapy's place within the modern system of integrative medicine and an assessment of its potential as a complementary method for supporting women's health.

Conclusions

Apitherapy is a promising field of integrative medicine that combines biological, ecological, and sensory factors of natural therapeutic influence.

The author's concept of the apitherapeutic pyramid, utilizing a bee therapy bed and developed by Anatoliy Olshanskyi, demonstrates an innovative approach to creating a multisensory therapeutic environment.

The use of this technology can be regarded as a complementary method for supporting women's health, aimed at improving psychological and emotional well-being, normalizing neurovegetative regulation and enhancing the body's adaptive capacity.

Further scientific research, including clinical trials, is necessary to investigate in greater depth the effectiveness and potential for integrating this technology into modern medical practice.

The author declares no conflict of interest.

References/Література

1. Berga SL. (2008). Stress and reproductive dysfunction. Endocrinology and Metabolism Clinics of North America.
2. Boyd-Brewer C, McCaffrey R. (2004, May-Jun). Vibroacoustic sound therapy improves pain management and more. Holist Nurs Pract. 18(3): 111-118; quiz 118-119. doi: 10.1097/00004650-200405000-00002. PMID: 15222599.
3. Buckle J. (2016). Clinical Aromatherapy: Essential Oils in Healthcare. Churchill Livingstone. Third Edition.

4. Chrousos G.P. (2009). Stress and disorders of the stress system. Nature Reviews Endocrinology. 5(7): 374-81. Epub 2009 Jun 2. doi: 10.1038/nrendo.2009.106. PMID: 19488073.
5. Hall JE. (2020). Guyton and Hall Textbook of Medical Physiology. Elsevier. Saunders, an imprint of Elsevier Inc.
6. Herz RS. (2009). Aromatherapy facts and fictions: a scientific analysis. International Journal of Neuroscience. 119(2): 263-290.
7. Herz RS. (2016). The role of odor-evoked memory in psychological and physiological health. Brain Sciences. 6(3): 22. doi: 10.3390/brainsci6030022. PMID: 27447673; PMCID: PMC5039451.
8. Krell R. (1996). Value-Added Products from Beekeeping. Food and Agriculture Organization of the United Nations. Rome. FAO Agricultural Services Bulletin No. 124.
9. Krell R. (2004). Apitherapy: the medicinal use of bee products. FAO Agricultural Services Bulletin: 429.
10. Liu JR, Yang YC, Shi LS, Peng CC. (2008). Antioxidant properties of royal jelly associated with the inhibition of lipid peroxidation. Journal of Agricultural and Food Chemistry. 56(23): 11447-11452.
11. Maizes V, Rakel D. (2009). Integrative Medicine. Oxford University Press.
12. Melmed S, Polonsky K, Larsen P, Kronenberg H. (2020). Williams Textbook of Endocrinology. Elsevier.
13. Molan P. (1992). The antibacterial activity of honey. Bee World. URL: https://www.academia.edu/2189571/Pdf_6_The_antibacterial_activity_of_honey_and_its_role_in_treating_diseases.
14. Molan PC. (2001, Nov-Dec). The potential of honey to promote oral wellness. Gen Dent. 49(6): 584-589. PMID: 12024746.
15. Pasupuleti VR, Sammugam L, Ramesh N, Gan SH. (2017). Honey, Propolis, and Royal Jelly: A Comprehensive Review of Their Biological Actions and Health Benefits. Oxid Med Cell Longev. 2017: 1259510. Epub 2017 Jul 26. doi: 10.1155/2017/1259510. PMID: 28814983; PMCID: PMC5549483.
16. Pavel CI, Marghitas LA, Bobis O, Dezmirean DS, Sapcaliu A et al. 2011. Biological activities of royal jelly. Journal of Medicinal Food. 44(2): 108-118.
17. Przybylski R, Firlej S, Kowalski R. (2018). Propolis and its potential use in modern medicine. Phytotherapy Research.
18. Ramadan MF, Al-Ghamdi A. (2012). Bioactive compounds and health-promoting properties of royal jelly: a review. Journal of Functional Foods. 4(1): 39-52.
19. Sforcin JM. (2007, Aug 15). Propolis and the immune system: a review. J Ethnopharmacol. 113(1): 1-14. Epub 2007 May 22. doi: 10.1016/j.jep.2007.05.012. PMID: 17580109.
20. Sforcin JM, Bankova V. (2011, Jan 27). Propolis: is there a potential for the development of new drugs? J Ethnopharmacol. 133(2): 253-260. Epub 2010 Oct 21. doi: 10.1016/j.jep.2010.10.032. PMID: 20970490.
21. Simone-Finstrom M, Spivak M. (2010). Propolis and bee health: the natural history and significance of resin use by honey bees. Apidologie. 41: 295-311.
22. Skille O, Wigram T. (1996). The effects of music, vocalisation and vibration on brain and body. Music Therapy Perspectives. In: Art & Science of Music Therapy. 1st Edition.
23. Snyderman R, Weil AT. (2002, Feb 25). Integrative medicine: bringing medicine back to its roots. Arch Intern Med. 162(4): 395-397. doi: 10.1001/archinte.162.4.395. PMID: 11863470.
24. Ventegodt S, Merrick J, Andersen NJ. (2007). Complementary and alternative medicine in modern health care. The Scientific World Journal.
25. Viuda-Martos M, Ruiz-Navajas Y, Fernández-López J, Pérez-Alvarez JA. (2008, Nov). Functional properties of honey, propolis, and royal jelly. J Food Sci.;73(9):R117-24. doi: 10.1111/j.1750-3841.2008.00966.x. PMID: 19021816.
26. White JW. (1957). Composition of honey. Bee World. 38(3): 57-66.
27. Yen SSC, Jaffe RB, Barbieri RL. (1999). Reproductive Endocrinology: Physiology, Pathophysiology and Clinical Management. Elsevier.
28. Zhang L, Wu L, Xu Y, Chen L. (2013). Honey: a natural product with health benefits. Food Chemistry.

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Стаття надійшла до редакції 17.01.2026 р.; прийнята до друку 22.03.2026 р.