

Role of forests in human disease-health prevention, rehabilitation and therapy

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Introduction-1

It cannot be denied that visiting a forest has real quantifiable health benefits - both mental and physical.



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Introduction-2

There is a growing appreciation of the forest as a

- recreational space for an urban population
- natural learning spot for children and adults
- space for physical activity and recreation
- complex ecosystem with various protective functions

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Forestal health and wellbeing contributions-1

Physical factors:

- air temperature
- air current (wind velocity)
- humidity
- illuminance
- radiant heat
- sounds (the sound of a waterfall, the whispering of the wind in the trees)

“these things give us a sense of comfort!”

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Forestal health and wellbeing contributions-2

Chemical factors:

- air composition (including essential oils)
- volatile organic compounds derived from plants or trees (e.g. alpha-pinene and limonene or so called phytoncides)

Note:

Many pharmaceutical products are derived from (tropical) forest species.

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The forest as a pharmacy

Many forest plants and animals produce poisons, fungicides, antibiotics and other biologically active compounds as defence mechanisms, and many of these have medicinal uses.

Compounds that have common medicinal uses such as cola nuts, caffeine, chocolate, chili peppers and cocaine are also found in forest areas.

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The forest as a pharmacy

Many western pharmaceutical products derive from tropical forest species: e.g.

- quinine from Cinchona spp.;
- cancer-treating drugs from rosy periwinkle (Catharanthus roseus);
- treatments for enlarged prostate gland from Prunus africana;
- forskolin, which has a variety of medicinal uses

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Forestal health and wellbeing contributions-3

Psychological factors: (psychological and affective responses to forest environments):

- cold/hot
- light/dark
- tense/relaxed
- relaxing/stimulating
- quiet/noisy
- plain/colorful

“they ease our stress and worry, help us to relax and to think more clearly!”

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Indirect Health effects

- Environmental Health effects
- Control of water-induced erosion rates
- Control of wind-induced erosion rates
- Wind protection
- Lifecycle maintenance, habitat and gene pool protection
- Regulation of soil quality (Humification and nutrient input into soils)
- Atmospheric composition and conditions (temperature, humidity)
- Forest biodiversity helps to combat malnutrition

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Health-promoting effects of forest exposure-1

- boosts the immune system
- lowers blood pressure
- reduces stress (cortisol and adrenaline ↓)
- improves mood and mental health
- increases ability to focus, even in children with ADHD
- accelerates recovery from surgery or illness
- increases energy level

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Health-promoting effects of forest exposure-2

- improves sleep
- prevents Cancer prevention (remarkable increase in the NK-cell activity)
- causes better cognitive skills and manual dexterity in Children playing in forest environments
- Induces benefits in reducing obesity and cardiovascular diseases

“Even 5 minutes around trees or in green spaces may improve health!”

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The health aspects resulting from a forest exposure are neglected by many European countries. This is particularly evident in comparison with e.g. Scotland, which explicitly took up the health aspects in the forestry strategy.



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Risk factors and adverse effects

Forest-related diseases and hazards

- **forest-related infectious diseases:** Puumala virus (PUUV), Lyme borreliosis, Hantavirus cardiopulmonary syndrome (HCPS), and malaria
- **tick-borne diseases:** such as Lyme disease and tick-borne encephalitis (FSME)

Note: the increased risk for Lyme disease in northeastern USA is connected with forest fragmentation, urban sprawl, and biodiversity loss

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Risk factors and adverse effects

Forest-related diseases and hazards

- forests expose people to physical hazards (e.g. forest fires, floods, drought, soil slides and haze)
- flora and fauna can provoke allergic or irritant reactions
- toxic fruits, foliage, and fungi



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Main strengths, weaknesses, possibilities, and threats for promoting human health through forests-1

Strengths

- Partly existing research base
- Growing awareness
- New cross-sectoral initiatives
- Good examples of integration of research results into practice

Weaknesses

- Insufficiently rigorous evidence base
- Weak integration of research and practice
- Lack of dialogue between disciplines and different professionals

Karjalainen, E. et al. Environ Health Prev Med (2010) 15:1-8

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Main strengths, weaknesses, possibilities, and threats for promoting human health through forests-2

- Possibilities**
- Improved health conditions
 - Combating hunger and poverty
 - Reduced health care budgets
 - New sources of income
- Karjalainen, E. et al. Environ Health Prev Med (2010) 15:1-8

- Threats**
- Climate change
 - Ecosystem and biodiversity degradation
 - Deforestation
 - Loss of green spaces in urban areas
 - Reluctance of policy-makers and practitioners

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Conclusion-1

1. There is a positive relationship between nature exposure and health promoting effects
2. There is increasing evidence of multifunctional benefits of forests
3. Forests and trees contribute in many ways to people's physical, mental and social health

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Conclusion-2

4. Nature has to play a stronger role in therapeutic approaches
5. Forests provide enormous possibilities to improve direct and indirect human health conditions
6. Utilizing forests effectively in health promotion could e.g. reduce public health care budgets and create new sources of income

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Clear orders for future

- This facts should be given greater consideration in the future development of health care strategies
- Stronger cooperation among researchers, policy-makers, and practitioners as well as between different sectors, especially between health and environmental professionals

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Thank you for your attention!

“There is evidence that exposure to natural environments or green spaces has positive health impacts”



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