



Review

HEALTHY LIFESTYLE AS A WAY TO MANAGE HEALTH RISKS: COMPONENTS AND FACTORS. ANALYTICAL REVIEW

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Healthy lifestyle promotion is a strategic task within health protection and healthcare worldwide. A prevailing contribution made by non-communicable diseases into premature death and a decrease in life expectancy makes it necessary to search for effective prevention and technologies able to persuade people to adhere to health protection behavior.

The review concentrates on approaches to defining, structuring and empirical study of persuasive design of healthy lifestyle. Substantiation is provided for including physical, mental and social health protection into healthy lifestyle. The review also discusses a possibility to use the Health-Promoting Lifestyle Profile (HPLP II) scale to analyze health behavior, including Asian countries. Structural components of healthy lifestyle are identified on the basis of the HPLP II scale.

Additionally, several mainstream health behavior theories and models have been selected and analyzed, which explain people's health behavior. They provide a theoretical basis for exploring influential factors of a healthy lifestyle. Contributions made by sociodemographic and cognitive factors have also been outlined and substantiation has been provided for the necessity to consider such factors as self-efficacy and subjective health perception when developing individual prevention.

This research holds valuable reference and guiding significance for the design and implementation of strategies aimed at influencing people's healthy lifestyles in related fields.

Keywords: healthy lifestyle, health behavior, behavioral theories, healthy lifestyle factors, Health-Promoting Lifestyle Profile, self-efficacy, preventive programs.

The 2030 Agenda for Sustainable Development adopted by the UN General Assembly in September 2015 includes a strategic goal on health with one of its targets being reduction by one third in premature mortality from non-communicable diseases¹, the major risk factor of which is human behavior. In September 2022, the WHO Regional Committee

for Europe adopted The European regional action framework for behavioral and cultural insights for health, 2022–2027 where it is stated that individual behavior and social circumstances together account for 60% of factors determining people's health. The framework points out the necessity to perform systematic exploration of individual and con-

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¹ Preobrazovanie nashogo mira: Povestka dnya v oblasti ustoichivogo razvitiya na period do 2030 goda: deklaratsiya General'noi assamblei OON ot 25 sentyabrya 2015 goda [Transformation of our world The 2030 Agenda for Sustainable Development: the UN general Assembly Declaration issued on September 25, 2015]. *KODEKS: electronic fund for legal and reference documentation*. Available at: <https://docs.cntd.ru/document/420355765> (June 17, 2023) (in Russian).

textual factors affecting health behaviors in European countries². In 2023, the WHO Western Pacific adopted the Regional Action Framework for Noncommunicable Disease Prevention and Control in the Western Pacific aimed at promoting and encouraging responsible health behaviors among people living in the region [1]. These decisions highlight a most considerable contribution made by health protection and healthy lifestyle to reduction of incidence and mortality all over the world. Multiple scientific research works report that a healthy lifestyle reduces risks of chronic diseases [2], effectively prevents cancer [3, 4] and cardiovascular pathology [5], diabetes [6], obesity [7] and mental disorders (for example, Alzheimer disease [8]).

A healthy lifestyle is usually perceived as individual habits and behaviors that promote physical and mental health [9]. The WHO has a wider concept of a healthy lifestyle as “a state in which a person exhibits relatively sound physical, mental, and social aspects under certain social, cultural, and spatial conditions” [10]. A promising concept here is that of “health lifestyles that are constellations of health behaviors underpinned by group-level identities and norms, which are consequential for health and well-being” [11]. Adherence to a specific lifestyle cannot be perceived as exclusively a person’s conscious choice since it is largely determined by social and cultural contexts [12]. This allows considering a healthy lifestyle not only an individual but also a group phenomenon.

This dual nature of a healthy lifestyle complicates its empirical analysis, which requires, first of all, determining structural characteristics of a healthy lifestyle at the group and individual level and, secondly, establishing relevant indicators for both specific

behaviors and standards and subjective senses underlying them.

In this study, our aim was to systematize approaches to structuring “a healthy lifestyle” concept at the individual level for its empiric analysis and to establish what factors determine adherence to a healthy lifestyle as a way to mitigate health risks.

Approaches to defining and structuring a healthy lifestyle. In English scientific literature, at least three terms can be found that describe the analyzed concept: “healthy life style”, “health-promoting life style” and “healthy lifestyle behavior”. One common component is orientation at behaviors developed by an individual which are aimed at promoting physical, mental and social health [13] (health and wellness improvement as an option) [14]. For example, R.A. Abdou, and H.A. Helal define a healthy lifestyle as a complex and multi-dimensional health behavior pattern involving six core areas: spiritual growth, interpersonal relations, nutrition, physical activity, health responsibility, and stress management [15]. T.C. Lewallen and others define a healthy lifestyle from the four dimensions of health responsibility, healthy diet, health literacy, and stress management. The authors believe that a healthy lifestyle prevents diseases and sustains or improves one’s health status [16]. Other American researchers, D.C. Grossman with colleagues, further explore the connotation of a healthy lifestyle and modify the connotation level classifications into five aspects: healthy behavior (reasonable diet, exercise, and adequate sleep); safe behavior (appropriate use of first aid facilities); preventive behavior (regular medical check-ups); risk factor reduction behavior (protecting the environment); eliminate unhealthy behaviors (smoking, alcohol, and other detrimental habits) [17].

² European regional action framework for behavioral and cultural insights for health, 2022–2027. WHO, *Regional Committee for Europe*. Israel, September 12–14, 2022. Available at: <https://iris.who.int/bitstream/handle/10665/360898/72wd06e-rev1-RegActionFramework-BCI-220516?sequence=1> (June 17, 2023).

A study that focuses on impacts of a lifestyle on mental health spots out five modifiable lifestyle factors: diet favorable for ‘brain health’, cognitive activities, physical activity, quitting smoking, and moderate alcohol consumption [18]. A study [19] reports that having a healthy lifestyle, often characterized by a combination of regular physical activity, not smoking, moderate consumption of alcohol, and healthy body mass index (BMI), has been associated with reduced cardiovascular disease morbidity and mortality and better cardiac health. When examining influence of a healthy lifestyle on diabetes, the authors of the study [20] mention non-smoking (never smoked or quit more than 10 years ago), healthy alcohol drinking (< 14 g/d of ethanol intake for females and < 28 g/d for males), sufficient physical activity and rational diet (depending on a health state) and waist circumference. In general, a trend to interpret a healthy lifestyle considering its impacts on physical health is typical for social-hygienic and social studies. But it should be noted that the contemporary world creates new threats for human health associated with intense urbanization, digitalization, technological development, growing demand for health services, and consumption of pharmaceuticals. These threats call for revision of conventional approaches to defining a healthy lifestyle. For example, it is advisable to consider such a component as ‘screentime’ (the number of hours per day spent working with a digital device or looking at its screen (smartphone, PC, TV, etc.)) [21] or use of medications, antibiotics in particular [22]. Thus, D. Farhud, an Iranian researcher, suggests a concept of a healthy lifestyle made of such components as diet, exercise, sleep, sexual behavior, substance abuse (psychoactive substances and smoking, hookahs included), medication

abuse, application of modern technologies, recreation and study [23]. The World Health Organization provides recommendations on a healthy lifestyle that encourage people to take antibiotics only as prescribed, have regular check-ups and keep social contacts with family and friends (‘someone you trust’) [24].

Empirical analysis of a healthy lifestyle. Particular indicators are necessary in the specific case analysis to determine whether a person’s lifestyle is healthy. Starting from 1980ties, several dozens of various instruments have been developed that use various empirical indicators of a healthy lifestyle. For example, in 1983, Douglas M.C. Wilson and others, Canada, introduced a FANTASTIC Lifestyle questionnaire (FLQ) that includes 28 items in 9 dimensions such as family and friends; activity and associativity; nutrition; tobacco; alcohol and other substances; sleep and stress; type of personality; introspection; control of health³. The questionnaire has several versions and is actively used by modern researchers [25]. In 2014, European researchers introduced a questionnaire to examine commitment to a healthy lifestyle and self-control The Healthy Lifestyle and Personal Control Questionnaire (HLPCQ) that includes 26 items in 5 directions such as dietary healthy choices, dietary harm avoidance, daily routine, organized physical exercise, social and mental balance [26]. In 2008, a team of Polish researchers developed a Positive Health Behaviors scale (PHBS) that was later modified in 2018. The questionnaire covers 29 items that describe 4 behavioral aspects, namely, nutrition, physical activity, relaxation and behaviors related to mental health, and preventive behaviors [27].

In 1987, an American research team guided by Susan N. Walker developed

³ Wilson D.M.C., Nielsen E., Ciliska D. Lifestyle Assessment: Testing the FANTASTIC Instrument. *Can. Fam. Physician*, 1984, vol. 30, pp. 1863–1866.

Health-Promoting Lifestyle Profile (HPLP)⁴. The questionnaire has several versions (Spanish⁵, Italian [28], Russian [29] translations) and modifications (in 1995, a revised version HPLP II was issued)⁶. The latest version is eligible for quantification and measures a healthy lifestyle in six aspects: spiritual growth, interpersonal relations, nutrition, physical activity, health responsibility, and stress management. Respondents are offered to express their attitudes towards 52 statements using 'never', 'sometimes', 'often', and 'routinely'. The total score of respondents is calculated by the scores associated with the four options to obtain the health index of the tested healthy lifestyle.

In 1997, the HPLP II was translated into Chinese⁷, and The Simplified Chinese Version of the 40-item Health-Promoting Lifestyles Profile (HPLP-C) was introduced in 2011 [30] and then successfully tested in 2012 by experts from Xi'an (Shensi, China) using a sample made of elderly Chinese living in mainland China [31]. Both versions of the questionnaire are used actively in modern studies performed on Asian samples [32, 33].

Healthy lifestyle indicators used in different HPLP modifications can provide grounds for identifying a structure of a healthy lifestyle.

Structural elements of a healthy lifestyle are identified based on their capacity to protect physical, mental or social health. Thus, physical health is promoted due to physical activity (it is measured empirically through its type, intensity, duration and frequency of do-

ing sports or exercises), nutrition (measured through diets and existing eating habits) and responsible health behavior (estimated through living conditions, following doctors' recommendations, attention paid to information about health, personal hygiene habits and bad habits). Mental health is promoted by spiritual growth and stress management. The former is estimated empirically through healthy attitudes towards life, awareness of health significance, belief in one's ability to achieve personal goals and mental (psychoemotional) state. The latter is measured through attitude towards pressure, decompression model, ability to control emotions and sleep timing and quality. And finally, social health is promoted through maintaining stable interpersonal relations as an element of a healthy lifestyle. This can be measured through communicative skills, cooperative attitudes, ability to understand others and social involvement as well.

When the structure of a healthy lifestyle was determined based on HPLP II, 'nutrition' as a dimension was adjusted as specific items in diet and nutrition were categorized into the dietary structure, dietary routine, and dietary habits. The exercise program items were classified into exercise type, intensity, duration, and frequency. Some of the unhealthy behaviors mentioned in the scale such as drinking and smoking were integrated with the indicators of health responsibility. The timing and quality of sleep were adjusted for stress management. Lastly, the social activity contents were adjusted to the interpersonal relations indicators.

⁴ Walker S.N., Sechrist K.R., Pender N.J. The Health-Promoting Lifestyle Profile: Development and psychometric characteristics. *Nurs. Res.*, 1987, vol. 36, no. 2, pp. 76–81. DOI: 10.1097/00006199-198703000-00002

⁵ Walker S.N., Kerr M.J., Pender N.J., Sechrist K.R. A Spanish language version of the Health-Promoting Lifestyle Profile. *Nurs. Res.*, 1990, vol. 39, no. 5, pp. 268–273.

⁶ Walker S.N., Sechrist K.R., Pender N.J. Health Promotion Model-Instruments to Measure Health Promoting Lifestyle: Health-Promoting Lifestyle Profile [HPLP II] (Adult Version), 1995.

⁷ Huang Y.H., Chiou C.J. Assessment of the health-promoting lifestyle profile on reliability and validity. *Kaohsiung J. Med. Sci.*, 1996, vol. 12, no. 9, pp. 529–537; Chen M.Y., Chou C.C., Huang H.S., Wang E.K., Chiou H.J. [et al.]. The development of Chinese version health promoting lifestyle profile. *Chang Gung Nursing*, 1997, vol. 8, pp. 14–24.

Overall, healthy lifestyle development and sustenance require individual, technological, and social efforts to increase public health awareness and guide and sustain appropriate behavior patterns.

Factors influencing commitment to a healthy lifestyle. Factors that influence commitment to a healthy life-style can be identified relying on theoretical behavioral models developed within social psychology and sociology. Thus, Knowledge, Attitude, Belief and Practice (KABP) model developed in 1986 by C.A. Kallgren and W. Wood⁸ is a knowledge belief behavior model, where the transformation of beliefs and attitudes depends on the accumulation of individual knowledge. Health Belief Model (HBM) developed by American researchers in the middle of 20th century highlights the significance of sociodemographic factors and perception in behavioral changes⁹. The HBM is an extension of the KABP model since its sociodemographic factors include knowledge factors included into the KABP model. In addition to that, the HBM outlines the significance of behavioral results for a social environment. Next, Social Cognitive Theory (SCT) considers self-efficacy, cognitive and environmental factors as underlying behavioral changes [34]. The Self-Determination Theory (SDT) by E.L. Deci and R.M. Ryan [35] defines self-efficacy and social impacts as key behavior-determining components. The postulate was further supported within the PROCEDE-PROCEED Model (PPM)¹⁰, which is a cost-benefit evaluation framework proposed in 1974 by L.W. Green to estimate demands as regards health and wellness.

Therefore, knowledge, belief, attitude, values, and self-confidence are primary factors influencing a specific behavior. Sociodemographic factors determine people's knowledge and abilities thus influencing their self-efficacy in terms of confidence, beliefs and cognitive abilities. The Figure provides the results of systematizing factors able to determine health behavior and, consequently, adherence to a healthy lifestyle.

Next, we are going to consider several factors; their impacts should be taken into account when designing recommendations on a healthy lifestyle.

Age. Following past literature, people's health behaviors shift with age. Based on Sellami, M. and others, older adults are less inclined to engage in regular physical activity and practice unhealthy diets compared to their younger counterparts. Physical inactivity and unhealthy diets are primary catalysts for chronic ailments involving heart disease, diabetes, and specific cancer types [36]. L.E. Graves and others' comparative study between young and old individuals using Wii Fit activities (yoga, muscle toning, balance, and aerobics) and brisk walking and jogging on the treadmill revealed that younger adults were more inclined to exercise compared to their older counterparts [37]. On the other hand, a survey with 1333 workers from several Italian companies participating in it revealed that the youngest employees (30 years and younger) presented the worst lifestyles and the lowest commitment to a healthy one [38]. A survey on a sample made of 180 Japanese people who had preventive check-ups in 2004 and 2005 established that subjective health concerns, not age, had the

⁸ Kallgren C.A., Wood W. Access to attitude-relevant information in memory as a determinant of attitude-behavior consistency. *Journal of Experimental Social Psychology*, 1986, vol. 22, no. 4, pp. 328–338. DOI: 10.1016/0022-1031(86)90018-1

⁹ Rosenstock I.M. The health belief model and preventive health behavior. *Health Educ. Behav.*, 1974, vol. 2, pp. 354–386. DOI: 10.1177/109019817400200405

¹⁰ Green L.W. Toward Cost-Benefit Evaluations of Health Education: Some Concepts, Methods, and Examples. *Health Education Monographs*, 1974, vol. 2, suppl. 1, pp. 34–64. DOI: 10.1177/10901981740020S106

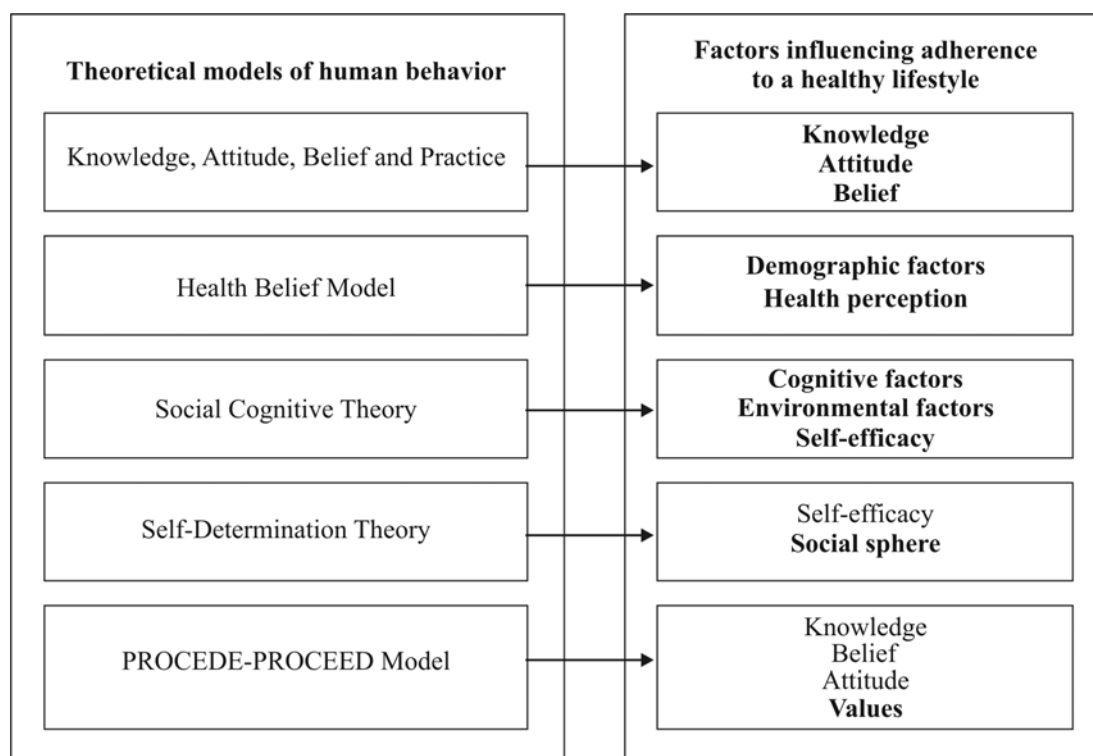


Figure. Systematization of factors influencing adherence to a healthy lifestyle

greatest impact on a lifestyle [39]. In other words, no significant correlation was identified between age factors and the implications of a health-promoting lifestyle. This finding characterizes the complexity and dynamics of the health behavior-age relationship. Ageing adults tend to struggle with physical conditions that inevitably impact their health behaviors. Notwithstanding, these individuals could spend more time engaging in health promotion interventions for improved health behaviors and outcomes.

Sex. Sex is a key factor in the health behavior-health outcome relationship; consequently, sex differences affect individuals' overall health and well-being. Generalized data obtained by 15 waves of all-nation surveys in Australia (2005–2019) showed that men tended to engage in health-risk behaviors (smoking and excessive alcohol consumption) while women were more inclined to participate in health-promoting behaviors (regular physical activity and a healthy diet) [40]. The differences underpinning these health behaviors

lead to varied health outcomes, with men being more susceptible to chronic illnesses (heart disease and certain cancer forms). Additionally, women are more hygienic and inclined to seek medical help. M.S. Lipsky's research on oral health differences between men and women revealed men's poor oral hygiene habits and tendency to disregard their oral health while women demonstrated better oral health, were more inclined to see a dentist, and were equipped with sufficient oral health knowledge [41]. J.G. Van Uffelen with colleagues further indicated the influence of sex roles on physical activity levels where men tend to participate in competitive sports while women are more likely to engage in leisure activities [42]. Likewise, cultural norms on diet and nutrition may differ between men and women, with women tending to prioritize healthy eating and weight management [43]. Sex-related differences in lifestyles can be associated with gender stereotypes, socialization peculiarities and conventional cultural norms [44].

Education. In examining the healthy lifestyle-education relationship, K. Friis and others conducted a large survey ($N = 29,473$) to investigate the correlation between education level and health behaviors (smoking, physical inactivity, poor diet, and obesity) [45]. Resultantly, the ability to understand health information was significantly associated with one's education level. Individuals with a lower education level tend to practice the foregoing unhealthier behaviors more often compared to their highly-educated counterparts. In line with R.A. Hahn and B.I. Truman, people with low education levels are more inclined to engage in unhealthy behaviors. The researchers believe that community members should be offered relevant programs to bridge these health education gaps and promote health equity following the significance of health education [46]. However, low education level does not always act as a single reason for health problems. For example, Y.Y. Chan and others' finding that highly-educated men tend to be overweight or obese may result from their access to better employment or sedentary occupations that induce physical inactivity [47].

Income. Much research has documented the health behavior-income relationship where income is considered a key determinant of individual health behaviors and outcomes. The means by which the causal socioeconomic status-health level relationship should be determined remains controversial [48]. J. Bor with colleagues noted that low-income people in the United States are inextricably linked to poor health following the lack of income equality [49]. People with lower income levels tend to engage in unhealthy behaviors with higher susceptibility to certain diseases. Contrarily, those with higher income levels are prone to engage in

health-promoting behaviors with optimal health outcomes. S.A. French and others' study implied that high-income groups prioritize nutrition in food choices while low-income families buy less healthy food. Such detrimental choices characterize the health-income relationship and highlight social causality of certain individual behaviors [50]. The results of surveys conducted in South Korea in 2019 and 2020 revealed that low-income women more often tended to have multiple and unhealthy characteristics in their lifestyle patterns than those in high-income groups [51].

Individuals with higher income levels have more access to resources and opportunities that support health-promoting behaviors to choose better exercise environments and healthy food items. Nevertheless, timely shifts in undesirable lifestyle habits could reflect positive health effects despite all the challenges encountered by individuals with lower income levels.

Health perception. Health self-assessment (or individual's subjective evaluation of his health status) plays a significant role in determining adherence to a healthy lifestyle. E. Singer with colleagues try to prove in their study that health perception is more important for choosing a particular lifestyle that results derived by objective health assessments¹¹. Multiple surveys involving students' samples established that people who considered their health to be poor were less inclined to health protection behavior, for example, to be physically active or have a healthy diet, compared to those who deem their health to be good [52]. D. Wang and others' research on Chinese college students' healthy lifestyles revealed a significant statistical difference in the healthy lifestyle score of college students with different self-

¹¹ Singer E., Garfinkel R., Cohen S.M., Srole L. Mortality and mental health: evidence from the Midtown Manhattan Re-study. *Soc. Sci. Med.* (1967), 1976, vol. 10, no. 11–12, pp. 517–525. DOI: 10.1016/0037-7856(76)90019-6

perceived health status [53]: students with good self-perceived health reflected the highest score, those with average self-perceived health denoted the middle score, and counterparts with poor self-perceived health demonstrated the lowest score.

A similar review on adults and their peculiar sport-related behaviors established that individuals who exercised regularly reported higher levels of fitness and a better self-perceived state of health compared to counterparts who did not exercise regularly [54]. These findings imply the positive association of health behaviors with perceived health status. Meanwhile, Y.C. Lin et al. revealed the positive implications of self-perceived health in mental health [55]: individuals who are overweight feel depressed about their appearance. This is a risk factor that could instigate psychological harm or motivate weight loss instead.

Overall, the aforementioned studies highlighted a positive health behavior-perceived health status relationship. A promising trend in further research would be an attempt to examine the intricate health behavior-perceived health status correlation. People with better health perception tend to experience the benefits of an active and healthy lifestyle, which enhances people's confidence in adopting an active and healthy lifestyle.

Self-efficacy. Self-efficacy is a definite predictor of a healthy lifestyle since any behavior is realized only due to internal motivation and confidence in achieving a desired effect. A person who does not have a sense of control over personal and situational factors will be less likely to act [56]. An association between self-efficacy and engagement in physical activity has been proven for various social groups including middle-aged [57] and elderly people [58], students [59], and adults with impairments [60]. Self-efficacy influences a decision to quit smoking [61] and to limit drinking [62]; it also raises medication adherence among patients after discharge from

hospital [63]. A study accomplished in the early 2020 in China revealed that high self-efficacy in adults authentically correlated with more active coping strategies and less intense psychological issues [64]. A survey on a sample made of 200 female healthcare workers in Wuhan (China) established a negative correlation between self-efficacy and anxiety levels [65]. Self-efficacy is positively correlated to healthy diets [66] and activities aimed at disease prevention [67].

It is important to note that self-efficacy determines not only adherence to a healthy lifestyle but also an individual's readiness to change a lifestyle, quit bad habits and switch to a behavioral model that allows better health protection.

Health cognition factors. Influence exerted by cognitive factors (beliefs, attitudes, values, and knowledge) is examined within health psychology and behavioral medicine [68]. Self-efficacy is often mentioned among cognitive factors affecting adherence to a particular lifestyle [69].

A study accomplished on a sample made of people living in Lapinlahti (Finland) focused on two cognitive factors. Factor 1 was underrating health risks and being resistant to change to achieve health promotion; Factor 2 was helplessness and pessimism as regards any changes in health behavior. As a result, it was established that people who were underrating/resistant and were apparently helpless/pessimistic were very unlikely to change their lifestyles to a more health-protecting one [70].

Impacts of cognitive factors on health behaviors are often studied by using the Healthy Lifestyle Beliefs Scale (HLB) [71]. A study on Turkish adolescents that involved using this scale established that beliefs in an ability to maintain a healthy lifestyle were a significant predictor of greater adherence to healthy diet and physical activity; they also affected self-efficacy associated with overweight [72].

The results of focus studies accomplished in Finland with participating 46 immigrants from Russia and Asian countries revealed significant influence of cultural factors on health attitudes and knowledge. They highlighted the necessity to develop a culturally tailored healthy lifestyle counseling program considering cultural, national and linguistic aspects [73].

Conclusion. The review highlights it is necessary to analyze people's adherence to a healthy lifestyle considering different factors that affect it, sociodemographic, socio-cultural and social-psychological ones. At the empirical level, the HPLP II scale can become an effective tool for measuring adherence to a healthy lifestyle since it allows comparative analysis and assessment of measurements as per specific healthy lifestyle indicators.

Age, sex, education level, income, and other sociological demographic factors relatively influence the formation of a healthy lifestyle according to the aforementioned studies. Nevertheless, a relevant situation relates to a specific research population and content. Perceived health status, self-efficacy,

and health cognition proved to be positively associated with a healthy lifestyle.

Formation of a healthy lifestyle among population is a significant issue within a social policy of every country or region in the world. Programs developed in this sphere can be effective only if they consider all factors affecting people's adherence to health protection. We should realize that healthy lifestyle communications are not sufficient; it is advisable to consider contributions made by social environments, social support, and personality factors and to try to achieve maximum possible personification of actions aimed at changing people's behavior.

Development of persuasive technologies aimed at changing people's health behavior can become a promising research trend. We believe that persuasive design can become an efficient way to promote healthy lifestyle behaviors in the 21st century.

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