

Time perspective: discussions on the application of the concept in the area of health and nursing

Perspectiva temporal: discussões sobre a aplicação do conceito na área da saúde e enfermagem

Perspectiva temporal: discusiones sobre la aplicación del concepto en el área de la salud y de la enfermería

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ABSTRACT

Objective: to discuss the application of the temporal perspective construct and the main analytical tools used in health and nursing studies. **Content:** the time perspective is one of the fundamental forces in people's lives and influences behavior, attitudes and decisions. Because it has a strong influence on behaviors, the field of health can be benefited with its application. The time dimensions of past, present and future are used in the codification, storage and retrieval of lived experiences, including health and illness, providing interpretations, setting goals and assisting in decision making. **Conclusion:** the importance of the time perspective's influence on health-related behavior is highlighted, since the incorporation of the temporal perspective evaluation into health care actions can also contribute to the practice of care, both for the prevention of behaviors considered harmful and for the development of protective behaviors for health.

Descriptors: Time perception; health behavior; delivery of health care; nursing.

RESUMO

Objetivo: discutir sobre a aplicação do construto da perspectiva temporal e os principais instrumentos de análise utilizados em estudos na área da saúde e da enfermagem. **Conteúdo:** a perspectiva temporal é uma das forças fundamentais na vida das pessoas e desempenha influência nos comportamentos, atitudes e decisões. Por ter forte influência nos comportamentos, o campo da saúde pode se beneficiar da sua aplicação. As dimensões temporais de passado, presente e futuro são usadas na codificação, armazenamento e recuperação de experiências vividas, inclusive de saúde e doença, fornecendo interpretações, estabelecendo metas e auxiliando a tomada de decisões. **Conclusão:** destaca-se a importância da influência da perspectiva temporal no comportamento relacionado à saúde, visto que a incorporação da avaliação da perspectiva temporal nas ações de cuidado à saúde também pode contribuir na prática da assistência, tanto para prevenção de comportamentos considerados prejudiciais, quanto para o desenvolvimento de comportamentos protetores para a saúde.

Descritores: Percepção do tempo; comportamento de saúde; cuidados de saúde; enfermagem.

RESUMEN

Objetivo: discutir la aplicación del construto de la perspectiva temporal y las principales herramientas analíticas utilizadas en los estudios de salud y enfermería. **Contenido:** la perspectiva del tiempo es una de las fuerzas fundamentales en la vida de las personas e influye en el comportamiento, las actitudes y las decisiones. Debido a que tiene una fuerte influencia en los comportamientos, el campo de la salud se puede beneficiar con su aplicación. Las dimensiones de tiempo del pasado, presente y futuro se utilizan en la codificación, almacenamiento y recuperación de experiencias vividas, incluida la salud y la enfermedad, proporcionando interpretaciones, estableciendo objetivos y ayudando en la toma de decisiones. **Conclusión:** se destaca la importancia de la influencia de la perspectiva del tiempo en el comportamiento relacionado con la salud, ya que la incorporación de la evaluación de la perspectiva temporal en las acciones de atención de la salud también puede contribuir a la práctica de la atención, tanto para la prevención de comportamientos considerados perjudiciales como para el desarrollo de comportamientos protectores para la salud.

Descriptores: Percepción del tiempo; conductas relacionadas con la salud; prestación de atención de salud; enfermería.

INTRODUCTION

Time is widely discussed in the various areas of knowledge and its definitions are comprehensive and explored in the literature through different concepts. In this sense, time is essential in the conduct of human life and is inherent to the individual. The psychological time can influence a series of events in the individual's life, from different perspectives, among which the temporal representations of the past, present and future.

Several authors have studied the phenomenon of time from a psychological point of view and its relationship with behavior, under a variety of names, one of the most used being the concept of Time Perspective. The way in which the individual experiences the present moment, thinks about the past and idealizes the future, is configured in a skill called temporal perspective, which is an unconscious cognitive filter that implies conscious behaviors and ways of thinking, in an insightful and intense¹.

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Between the forties and fifties, the temporal perspective was defined as the set of points of view of the individual about his psychological past and future, existing at a given moment². Since the studies aimed at defining the temporal perspective began, an extensive amount of research on the subject and its relations with different variables has been conducted³. Thus, several measuring instruments have been developed in recent decades and are inserted in the field of Psychology of Time.

It is said that the temporal perspective is one of the crucial forces in people's lives and influences behavior, attitudes and decisions. However, usually the individual has no discernment of such an influence, turning the temporal perspective into something unconscious. However, by converting it into something conscious, it can be controlled and, by allowing this, the individual will be able to manage it and lead a happier and more successful life⁴.

Thus, this study proposes to discuss the application of the construct of the temporal perspective and the main analysis instruments used in the area of health and nursing.

The construct of the temporal perspective

Most theoretical propositions about the temporal perspective follow the Lewisian tradition that emphasizes the understanding of the perception of time as fundamental for the orientation and functioning of life. This model includes the influence of the past and the future on current behavior, whether in the individual and/or collective aspect. In this sense of thinking, numerous studies have been developed on the temporal perspective, considering that such perspective contributes to ordering, coherence and meaning to events⁴, defining it as

[...]a subjective and often unconscious way in which each of us relates to time and the process by which the continuous flow of personal and social experiences is attributed and divided into temporal categories, or frames, which help to give form, coherence and meaning to the events^{5:88}.

For these authors, decision making can have a dominant influence over one of the temporal dimensions, that is, for some people, remembering past situations and assessing their costs and benefits are fundamental to current decisions, and such memories can be traumatic, negative or nostalgic and positive.

In a brief survey of the literature, 430 articles were found related to the construct of the temporal perspective. These studies address the temporal perspective supported by several other constructs and concepts, with analyzes and constructions outlined according to the methods and instruments available for measurement. The main theoretical propositions cited in studies in the health field, as well as the instruments for analyzing the temporal perspective are shown in Figure 1.

Zimbardo and Boyd (1999) ⁴	<i>Stanford Time Perspective Inventory (STPI)</i> <i>Zimbardo Time Perspective Inventory (ZTPI)</i>
Carstensen et al (1996) ⁶	<i>Future Time Perspective Scale (FTPS)</i>
Strathman e colaboradores (1994) ⁷	<i>Consideration of Future Consequences (CFC)</i>
Lewin (1951) ²	
Nuttin e Lens (1985) ⁸	
Fong e Hall (2003) ⁹	<i>Time Perspective Questionnaire (TPQ)</i>
Cottle (1976) ¹⁰	<i>Cottle's Circle</i>
Shell e Husman (2001) ¹¹	<i>Future Time Perspective (FTS)</i>
Peetsma (1992) ¹²	<i>Time Perspective Questionnaire (TPQ)</i>
Shirai (1994) ¹³	<i>Shirai's Experiential Time Perspective Scale</i>
Farber (1953) ¹⁴	<i>Feeling Tone in the Perception of the Days of the Week</i>

FIGURE 1: Theoretical proposals and instruments for analyzing the temporal perspective. Rio de Janeiro, Brazil, 2019.

Some authors have approached the temporal perspective based on the theoretical construction of the researchers mentioned above associated with other instruments or started from these constructions to outline new instruments, such as: *Questionnaire of Future Time Perspective (QFTP)*¹⁵; *Balanced Time Perspective Scale (BTPS)*¹⁶; *Inventário de Perspectiva Temporal (IPT)*¹⁷ e *Temporal Focus Scale (TFS)*¹⁸.

The first measures reported in the literature are indirect, as a metaphorical method in which participants select circles of different sizes to represent the past, the present and the future (*Cottle's Circle*); other more direct measures, require the respondent to list future events and the age at which they expect them to happen, with the average age being the score of the future, as for example in the *Time Perspective Questionnaire*^{9-10,19}.

The studies by Zimbardo and collaborators culminated in the development of the *Zimbardo Time Perspective Inventory* or *Zimbardo's Temporal Perspective Inventory (ZTPI)*, which constituted a new milestone in the studies on the temporal perspective. The instrument is highlighted for its psychometric quality and aims to assess the temporal perspective in a global way, covering the three time-oriented zones - past, present and future^{4,17}.

Through this instrument, the temporal perspective is measured based on five defined dimensions: the negative past, which is possibly related to past traumatic events; the positive past, which shows an appreciative and pleasant view of the past; the fatalistic present characterized by a pessimistic view of the present; the hedonist-present, connected to momentary pleasures and without considering the consequences; and the dimension of the future, which relates to the expectations of reaching long-term goals and objectives¹⁰.

The ZTPI measures the temporal perspective through its subscales containing proposals marked over time about the beliefs, values and preferences that individuals associate with their experiences. The full version contains 56 items and response options on a *Likert* type scale, with five points: "It is never true", "it is rarely true", "neutral", "almost always true" and "always true", and the participant is asked to indicate the option that best suits their life^{4,19}.

In a complementary aspect, authors⁶ explored the field of the temporal perspective by relating it to the individual's chronological age, stating that social objectives can change according to the age. For these authors, the temporal perspective integrates human motivation and suggests possible implications for multiple areas of knowledge, including social, human, cultural, cognitive and clinical psychology. In this context, the *Future Time Perspective Scale (FTPS)*⁶, with 10 items on seven levels of responses ranging from "strongly disagree" to "strongly agree", with higher scores indicating a more expansive vision of the future²⁰⁻²¹.

Following the trend of studies focusing on the perspective of the future, an instrument called *Consideration of Future Consequences (CFC)* was proposed, developed from the hypothesis of the difference between what people consider as future or immediate consequences of their behavior⁷. When conducting research using this scale, it was noted that the scores may indicate concerns about future consequences, immediate or both, causing doubts in the interpretation of the findings. From the results, one identified the need for separation between the elements labeled as factors of the future and immediate factors, thus arising, CFC-14²², composed by two factors, *Consideration of Future Consequences (CFC-F)* and *Consideration of Immediate Consequences (CFC-I)*.

Application of the temporal perspective construct in health and nursing

The temporal aspects of people's daily lives can be divided into: Use of time, pace of life, time orientation and temporal perspective. The use of time is the distribution that each individual makes of their time during daily activities, such as working, eating, performing leisure activities, reserving time for commuting and personal care. The pace of life refers to the speed with which the day's activities are carried out. Time orientation refers to how people compare the present to the future, considering both hopes and fears. The temporal perspective, as presented in this study, is the way in which people judge the passage of time²³.

Authors state that the temporal perspective is a multidimensional concept and can be contextualized in terms of attitude, orientation, relationship, frequency and meaning. Time attitude defines the positivity or negativity of feelings in relation to the past, present and future; temporal orientation refers to the emphasis on the past, present or future, which can determine the present action; the temporal relationship refers to the degree of perception of the individuals in the causal relationships between what happened, what is happening and what may come to happen; the frequency of time, refers to the extent to which each individual thinks about the past, present and future; and, the meaning of time reflects how the individual defines the periods of the past, present and future, commonly influenced by culture²⁴.

Considering the temporal perspective as a construct of psychology that analyzes the temporal orientation of individuals and can influence behavior, the field of health can benefit from its application. In this sense, scientists, professionals and lay people in the health field are faced with the arduous task of seeking and understanding what leads people to perform behaviors harmful to health.

The temporal perspective is able to explain why people have difficulties in maintaining healthy behavior patterns, as well as maintaining others that lead to mental and physical illness. Individual motivation to perform health-friendly behaviors is essential to preserve it in the short and long term⁹.

Studies show that negative past experiences are associated with anxiety and depression, as well as with low self-esteem. However, the time perspective focused on the present is related to vulnerable behaviors and the use of substances that cause dependence, while an orientation directed towards the future is associated with the early detection of cervical cancer²⁵⁻²⁶.

The time perspective can also be related to practices that increase the vulnerability to sexually transmitted infections²⁷⁻²⁸. There is also evidence that the negative-past or the fatalistic-present may be related to suicidal behavior in high-school students²⁹.

Visibly, the impulse in research related to the temporal perspective occurred after the development of the ZTPI. The instrument is available in more than 40 languages, with different cross-cultural versions and validations, highlighting the tendency to reduce the original version to short versions, with fewer items, aiming at more agility of application and guaranteeing the psychometric properties³⁰.

The temporal perspective can be a marker of health-related vulnerabilities, since it refers to the relative temporal orientation that motivates the typical actions and goals of an individual or group³¹. In this way, the construct of the temporal perspective allows health professionals to seek more holistic strategies for the management of chronic diseases centered on the patient³²⁻³⁴. The potential of the temporal perspective construct resides in the contribution to adherence to health care actions, as studies have shown that adults with a future perspective oriented towards the future have better health care practices^{31,35}.

In this sense, people with a temporal perspective focused on the present-fatalist may have little belief in the attitudes and efforts that culminate in improving current or future health. Individuals oriented towards the present-hedonist expect immediate gratification and thereby avoid lifestyle changes. However, those with a forward-looking time perspective can invest their energies for lifestyle changes³⁵⁻³⁶.

Humanized care is strongly related to nursing, since professionals in the field have great potential in contributing to the individual's well-being. In this sense, it is inferred that the integration of the assessment of the temporal perspective in the care practices may assist in the investigation of behaviors and attitudes, which perhaps interfere in the processes of self-care.

It is believed that it is important to consider the temporal perspective in nursing care practices, both for the prevention of harmful health behaviors and for the development of perspectives that encourage protective health behaviors. The temporal perspective is considered a characteristic that can be modified, however, the need for further studies on the stability and mutability of this construct is reiterated.

In view of this, the need to analyze the profiles from the time perspective is defended and, then, bet that those who do not have a balanced profile can acquire it. The possibility of modifying the temporal profile may be relevant, requiring action by the health team, since the balanced profile has been described as a characteristic of physical and mental health¹⁰ and better well-being indicators³⁷, reinforcing the importance of the temporal perspective for the determination of behaviors and for the perception of quality of life.

Thus, health care is a relationship established between people and groups, with a view to improving health status and quality of life. Therefore, the care practices performed by the professionals cannot be restricted to the technique alone, but must be expressed through attitudes and relationships with the other to whom the care is offered.

The adaptation processes to the new situations posed by a disease condition must also consider changes in the assessment of temporal patterns, which refer to the relationships established between times and situations in the past, present and future, which are equally susceptible to changes. From a clinical point of view, it is possible to identify relationships established between the adaptation processes and the installed disease, analyzing the coping mechanisms, the standards against which the person is compared, the values and expectations related to the disease, and the achievements personal effects, modified or not by the adaptation process, resulting in the assessment of quality of life.

Thus, for health education and prevention and promotion actions to culminate in changes in daily life, the identification of temporal orientation and analysis of the profile of the temporal perspective can act as a facilitator for the understanding of behaviors, attitudes and actions of decision-making regarding the vulnerability of the different

groups. Reiterating the statement that knowledge, by itself, does not reflect the mobilization for protective behaviors, acting in a temporal perspective can be an alternative to demonstrate that attitudes in the present result in consequences in the future.

These behaviors may be related to improving health in general, such as physical activity, healthy eating, not using harmful substances such as alcohol, tobacco and other drugs, as well as attitudes related to safer sexual behavior.

CONCLUSION

The advance in the theoretical development in the concept of the temporal perspective has contributed to the explanation of this phenomenon in different areas, reinforcing the need for continuity in studies in different cultures, populations and circumstances. Thus, the study of the temporal perspective provided an appreciative reflection on the concept and its application in the area of health and nursing, through which it enables the understanding of behaviors that are configured in various aspects of human life.

The incorporation of the assessment of the temporal perspective in health care actions can also contribute to the practice of care, both for the prevention of behaviors considered harmful in the face of a pathological condition, and for the development of reinforcing perspectives of protective behaviors. Future studies on the assessment of the temporal perspective are recommended, as this may be an indicator of the prediction of favorable or unhealthy events. In this way, it would make it possible to establish whether individuals are in a situation of vulnerability, requiring a more effective intervention in order to reduce the tendency of excessive concentrations to one of the temporal dimensions, especially those considered to be at greatest risk to health and quality of life.

REFERENCES

1. Boniwell I, Zimbardo PG. Balancing time perspective in pursuit of optimal functioning. In: Linley PA, Joseph S. (Eds.). *Positive psychology in practice*. Hoboken (NJ): John Wiley & Sons, Inc; 2004 [cited 2019 Nov 07]. DOI: 10.1002/9780470939338.ch10
2. Lewin K. *Field theory of social science: selected theoretical papers*. New York (NY): Harper & Brothers; 1951 [cited 2019 Nov 07]. DOI: <https://doi.org/10.1177/000271625127600135>
3. Kashio M. Time perspective and motivation in interpersonal contexts. *Japan Psychol Res*. 2012[cited 2019 Nov 07]; 54:297-309. DOI: <https://doi.org/10.1111/j.1468-5884.2012.00533.x>
4. Zimbardo PG, Boyd JN. Putting time in perspective: A valid, reliable individual-differences metric. *J Pers Soc Psychol*. 1999 [cited 2019 Nov 07]; 77:1271-88. DOI: <https://doi.org/10.1037/0022-3514.77.6.1271>
5. Boyd JN, Zimbardo PG. Time perspective, health and risk taking. In: Strathman A, Joireman J. (Eds.), *Understanding behavior in the context of time: Theory, research and application*. Mahwah (NJ): Lawrence Erlbaum; 2005[cited 2019 Nov 07]. Available from: <https://psycnet.apa.org/record/2005-06803-005>
6. Carstensen LL, Isaacowitz ST, Charles ST. Taking time seriously: a theory of socioemotional selectivity. *Am Psychol*. 1999 [cited 2019 Nov 07]; 54:165-81. DOI: <https://doi.org/10.1037/0003-066x.54.3.165>
7. Strathman A, Gleicher F, Boninger DS, Edwards CS. The consideration of future consequences: weighing immediate and distant outcomes of behavior. *J Pers Soc Psychol*. 1994 [cited 2019 Nov 07]; 66:742-52. DOI: <https://doi.org/10.1037/0022-3514.66.4.742>
8. Nuttin J, Lens W. *Future time perspective and motivation. Theory and research method*. Bélgica: Leuven University Press/Hillsdale; 1985.
9. Fong GT, Hall PA. Time perspective: a potentially important construct for decreasing health risk behaviors among adolescents. In: Romer D. (Ed.). *Reducing adolescent risk: toward an integrated approach*. Thousand Oaks, CA: Sage Publications; 2003 [cited 2019 Nov 07]. DOI: <https://doi.org/10.4135/9781452233611.n13>
10. Oyanadel C, Buela-Casal G. La percepción del tiempo: influencias en la salud física y mental. *Univ. Psychol*. 2011 [cited 2019 Nov 07]; 10(1):149-61. DOI: <https://doi.org/10.11144/javeriana.upsy10-1.ptis>
11. Shell DF, Husman J. The multivariate dimensionality of personal control and future time perspective beliefs in achievement and self-regulation. *Contemp Educ Psychol*. 2001 [cited 2019 Nov 07]; 26:481-506. DOI: <https://doi.org/10.1006/ceps.2000.1073>
12. Peetsma TTD. Future time perspective as a predictor of school investment. *Scand J Educ Res*. 2000 [cited 2019 Nov 07]; 44:177-92. DOI: <https://doi.org/10.1002/adfm.200400429>
13. Shirai T. A study on the construction of Experiential Time Perspective Scale. *J Psychol*. 1994 [cited 2019 Nov 07]; 65:54-60. DOI: <https://doi.org/10.4992/jjpsy.65.54>
14. Farber ML. Time-perspective and feeling-tone: A study in the perception of the days. *J Psychol*. 1953 [cited 2019 Nov 07]; 35:253-57. DOI: <https://doi.org/10.1080/00223980.1953.9712859>
15. Carvalho RG. Quantitative and Qualitative Assessment of Adolescents' Future Time Perspective. *Paidéia*. 2015[cited 2019 Nov 07]; 25(61):163-72. DOI: <https://doi.org/10.1590/1982-43272561201504>
16. Webster JD. A new measure of time perspective: Initial psychometric findings for the Balanced Time Perspective Scale (BTPS). *Can J Behav Sci*. 2011 [cited 2019 Nov 07]; 43(2):111-18. DOI: <https://doi.org/10.1037/a0022801>

17. Janeiro IN. O Inventário de Perspectiva Temporal: estudo de validação. *Rev Iberoam Diagn Eval Psicol*. 2012[cited 2019 Nov 07]; 34(2):117-32. Available from: https://www.aidep.org/03_ridep/R34/ART%206.pdf
18. Shipp AJ, Edwards JR, Lambert LS. Conceptualization and measurement of temporal focus: The subjective experience of the past, present, and future. *Organ Behav Hum Decis Process*. 2009 [cited 2019 Nov 07]; 110:1-22. DOI: <https://doi.org/10.1016/j.obhdp.2009.05.001>
19. Estudo de validação do Inventário de Perspectiva de Tempo do Zimbardo. *Aval. psicol*. 2008 [cited 2019 Nov 07]; 7(3):301-20. Available from: <http://pepsic.bvsalud.org/pdf/avp/v7n3/v7n3a05.pdf>
20. Stahl ST, Patrick JH. Adults' future time perspective predicts engagement in physical activity. *J Gerontol B Psychol Sci Soc Sci*. 2012 [cited 2019 Nov 07]; 67(4):413-16. DOI: <https://doi.org/10.1093/geronb/gbr118>
21. Kellough JL, Knight BG. Positivity effects in older adults' perception of facial emotion: the role of future time perspective. *J Gerontol B Psychol Sci Soc Sci*. 2012 [cited 2019 Nov 07]; 67(2):150-58. DOI: <https://doi.org/10.1093/geronb/gbr079>
22. Joireman J, Balliet D, Sprott D, Spangenberg E, Shultz J. Consideration of future consequences, ego-depletion, and self-control: support for distinguishing between CFC-immediate and CFC-future sub-scales. *Pers Individ Dif*. 2008 [cited 2019 Nov 07]; 48:15-21. DOI: <https://doi.org/10.1016/j.paid.2008.02.011>
23. McGrath JE, Tschan F. Temporal matters in social psychology: Examining the Role of Time in the Lives of Groups and Individuals. Washington (DC): APA; 2004.
24. Mello ZR, Worrell FC. The past, the present, and the future: a conceptual model of time perspective in adolescence. In: Stolarski M, Fieulaine N, Van Beek W. (eds). *Time perspective theory; review, research and application: essay in honor of Philip G. Zimbardo*. Spring Intern, 2015. [cited 2019 Nov 07] DOI: https://doi.org/10.1007/978-3-319-07368-2_7
25. Keough KA, Zimbardo PG, Boyd JN. Who's smoking, drinking, and using drugs? Time perspective as a predictor of substance use. *Basic Appl Soc Psych*. 1999 [cited 2019 Nov 07]; 21:149-64. DOI: <https://doi.org/10.1207/s15324834ba210207>
26. Roncancio AM, Ward KK, Fernandez ME. The influence of time perspective on cervical cancer screening among Latinas in the United States. *J Health Psychol*. 2014 [cited 2019 Nov 07]; 19(12):1547-53. DOI: <https://doi.org/10.1177/1359105313495073>
27. Rothspan S, Read SJ. Present versus future time perspective and HIV risk among heterosexual college students. *Health Psychol*. 1996 [cited 2019 Nov 07]; 15(2):131-4. DOI: <https://doi.org/10.1037/0278-6133.15.2.131>
28. Aboussalam N, Naudé L, Lens W, Esterhuyse K. The relationship between future time perspective, self-efficacy and risky sexual behavior in the Black youth of central South Africa. *J Ment Health*. 2015 [cited 2019 Nov 07]; 25(2):176-83. DOI: <https://doi.org/10.1007/s10508-017-1123-1>
29. Laghi F, D'Alessio M, Pallini S. Attachment representations and time perspective in adolescence. *Soc Indic Res*. 2009 [cited 2019 Nov 07]; 90:181-94. DOI: <https://doi.org/10.1007/s11205-008-9249-0>
30. Carvalho RG, Pocinho M, Silva C. Comportamento adaptativo e perspectivação do futuro: algumas evidências nos contextos da educação e da saúde. *Psicol Reflex Crit*. 2010 [cited 2019 Nov 07]; 23(3):554-61. DOI: <https://doi.org/10.1590/s0102-79722010000300016>
31. Henson JM, Carey MP, Carey KB, Maisto SA. Associations among health behaviors and time perspective in young adults: Model testing with boot-strapping replication. *J Behav Med*. 2006 [cited 2019 Nov 07]; 29:127-37. DOI: <https://doi.org/10.1007/s10865-005-9027-2>
32. DiMatteo MR, Haskard KB, Williams SL. Health beliefs, disease severity, and patient adherence: a meta-analysis. *Med Care*. 2007 [cited 2019 Nov 07]; 45(6):521-8. DOI: <https://doi.org/10.1097/MLR.0b013e318032937e>
33. Ponienman D, Wisnivesky JP, Leventhal H. Impact of positive and negative beliefs about inhaled corticosteroids on adherence in inner-city asthmatic patients. *Ann Allergy Asthma Immunol*. 2009 [cited 2019 Nov 07]; 103(1):38-42. DOI: [https://doi.org/10.1016/s1081-1206\(10\)60141-x](https://doi.org/10.1016/s1081-1206(10)60141-x)
34. Broadbent E, Donkin L, Stroh JC. Illness and treatment perceptions are associated with adherence to medications, diet, and exercise in diabetic patients. *Diabetes Care*. 2011 [cited 2019 Nov 07]; 34(2):338-40. DOI: <https://doi.org/10.2337/dc10-1779>
35. Guthrie LC, Lessl K, Ochi O, Ward MM. Time perspective and smoking, obesity, and exercise in a community sample. *Am J Health Behav*. 2013 [cited 2019 Nov 07]; 37(2):171-80. DOI: <https://doi.org/10.5993/AJHB.37.2.4>
36. Sansbury B, Dasgupta A, Guthrie L, Ward MM. Time perspective and medication adherence among individuals with hypertension or diabetes mellitus. *Patient Educ Couns*. 2014 [cited 2019 Nov 07]; 95(1):104-10. DOI: <https://doi.org/10.1016/j.pec.2013.12.016>
37. Boniwell I, Osin E, Linley PA, Ivanchenko GV. A question of balance: time perspective and well-being in British and Russian samples. *J Posit Psychol*. 2010 [cited 2019 Nov 07]; 5(1):24-40. DOI: <https://doi.org/10.1080/17439760903271181>