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Time Perspective in Healthy Individuals and Patients Suffering from Cancer and Diabetes

Abstract

Introduction: Time orientation can significantly improve health-related prevention behaviour and influence disease outcome through boosting health-oriented behaviour. This study aims to compare time perspective between diabetic and cancerous patients, and healthy people.
Methods: A cross-sectional descriptive study was conducted on 300 patients (105 healthy, 195 patients: 108 type 2 diabetes and 87 breast and digestive system cancer) aged 20 to 70 years (average age of 45.4 years). The samples were separated into three groups based on a convenience sampling method and were matched in terms of gender, age, education and monthly income. Data was collected through the Zimbardo Time Perspective Inventory (ZTPI-56) questionnaire and then evaluated with analysis of covariance (F test) followed by Fisher's Least Significant Difference (LSD) test.
Results: The three groups showed different time perspectives ($F = 4.213$, $p < 0.05$) and different ranking in time orientation.
Conclusion: Our findings show that the disease and its type can significantly impact the time orientation of patients. Therefore, to prevent potential subsequent outcomes, the patients' time perspective towards disease should be improved, especially under disease conditions.

Keywords: time orientation; digestive system cancer; breast cancer; diabetes mellitus type 2

Perspektywa czasu u osób zdrowych i pacjentów cierpiących na raka lub cukrzycę

Streszczenie

Wprowadzenie: Orientacja czasowa może znacząco wzmacniać zachowania prewencyjne dotyczące zdrowia i wpływać na wynik choroby przez wspomaganie zachowań prozdrowotnych. Celem badania jest porównanie perspektywy czasowej wykorzystywanej przez pacjentów z cukrzycą, chorobą nowotworową oraz ludzi zdrowych.

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Metody: Opisowe badanie przekrojowe zostało przeprowadzone na 300 pacjentach (105 osobach zdrowych, 195 pacjentach: 108 z cukrzycą typu 2 i 87 z rakiem piersi i układu trawiennego) w wieku od 20 do 70 lat (średnia wieku to 45,4). Próby zostały podzielone na trzy osobne grupy na podstawie przypadkowego doboru i dopasowane pod względem płci, wieku, wykształcenia i miesięcznego dochodu. Dane zebrane zostały za pomocą kwestionariusza ZTPI-56, a następnie ocenione analizą kowariancji (*F* test) po przeprowadzeniu testu najmniej znaczącej różnicy Fishera (LSD).
Wyniki: Trzy grupy wykazały różne perspektywy postrzegania czasu ($F = 4.213$, $p < 0.05$) i odmienny ranking w orientacji czasu.
Wniosek: Wyniki pokazują, że choroba i jej rodzaj w znaczący sposób wpływają na preferowaną orientację czasową pacjentów. Dlatego w celach prewencyjnych, należy poprawiać perspektywę postrzegania czasu u osób funkcjonujących w warunkach choroby.

Słowa kluczowe: orientacja temporalna, nowotwór układu pokarmowego, nowotwór płuc, cukrzyca typu 2

Introduction

Time perspective is a main dimension in soul time structures, putting an individual's cognitive experiences in past, present and future time frameworks. These frameworks facilitate experiences to be consistent, meaningful, orderly, and are used in decoding, storing and recalling events. Following learning, these experiences have a dynamic influence on judgments, decision making and performance of individuals (Zimbardo & Boyd, 1999; Anagnostopoulo & Griva, 2011). Individual difference in time orientation is brought from cultural factors, common religious features, values, and the economic level (Liniauskaite, 2007).

Zimbardo and Boyd (2008) believed that emphatic tendencies of an individual's time categories influence his/her decisions. In this regard, the time vivid effect, that for some people originated in the past, gets along by recalling previous similar conditions and the loss or profit they had. Such concentration on the past can significantly influence interpretation and response in present conditions. On the other hand, focusing on the future along with evaluating optimal rewards, real and potential obstacles and challenges, influence present decision making. In both cases, past reconstruction abstract process and function construction in the future and influence present decision making, enabling a person to go beyond binding driving forces in life, the person delays satisfying sources leading to adverse consequences. Individuals are always turning between past, present and future time perspectives regarding condition, demands, values and sources evaluation or cognitive and social evaluation. A balanced time orientation is essential to keep balance between past experiences, present time propensities and future consequences (Zimbardo & Boyd, 1999; Zimbardo & Boyd, 2008). Osin et al. (2009) demonstrated that confining different categories of an individual's attitude to a time category reduces performance.

Zimbardo and Boyd (1999) considered five dimensions of the time perspective structure: Past-Positive (PP), Past-Negative (PN), Present-Fatalistic (PF), Present-Hedonistic (PH), and Future (F). The goal behind the past-oriented time structure is

that not good or bad events occurred. For instance, a positive attitude towards the past may reflect the positive events individuals experienced or a positive attitude that allows them to efficiently smooth tough conditions. Psychologically speaking, what individuals believe happened in their past life influences their present thought, feeling and behaviour more than what really happened. Orientation towards present is determined by two factors – Present-Hedonistic and Present-Fatalistic. PH is characterized as enjoyment, risk taking, little attention to future outcomes, pleasance, excitement, and lack of today dedication for a reward tomorrow. The PF factor shows if the individuals possess a fatalistic attitude towards life and believe that the future is destined. In other words, an individual's actions to change do not work, thus they have to resort to their destiny. Future dimension is also accompanied by planning, striving for future goals, and achieving success. Future outcome predictors are conscience, dependence, priority, consistency, rewards, low levels of exploring freshness, and excitement desire (Zimbardo & Boyd, 2008).

Health related studies indicated that diverse temporal perspective dimensions influence sleep and dream problems, style coping and quality, health-oriented behaviour, prevention and screening related behaviour, and high-risk behaviour such as alcohol abusing and illegal sexual affairs (Zambianchi, Bitti & Paola, 2010; Pelard, Apostolidis, Ben Soussan & Goncalves, 2008; Fieulaine & Martinez, 2009; Zimbardo & Boyd, 1999). In addition, some studies indicated that sensitivity to behavioural prevention and an extreme behaviour system are accompanied by lower future orientation that results in unhealthy behaviours and psychological injuries (Bejornebekk & Gjesme, 2009).

Diabetes is one of the most complicated chronic diseases resulting in various psychological dysfunctions particularly stress, anxiety and depression (Hamid, 2011). Didarlou et al. (2011) reported that attitudes of diabetic patients are associated with their behavioural intention. They showed the higher the patients' beliefs in self-care behaviours, the higher the probability of health-improving behaviour adaption.

Despite medical advancements in cancer treatment and control, it is still one of the most leading causes of mortalities worldwide with no definite treatment. During the advanced stages of cancer, patients experience extreme pains that influence various aspects of their lives. They struggle to cope with the conditions of disease. This stage is demanding and stressful for many patients. Studies on cancer-stricken children revealed that future time perspective (forward-looking) is associated with optimism (Zimbardo & Boyd, 1999). The studies conducted on cancerous disease have implied that screening people with family history of cancer is a significant factor in reducing the cancer-stricken death danger. Diagnosing life threatening disease like cancer has various effects on life quality (Ghadimi et al., 2011).

Some studies indicated that time perspective influences disease preventive behaviours so that forward-looking people demonstrate disease preventive behaviours like cancer screening and maintain higher health level (Anagnostopoulo & Griva, 2011; Fieulaine & Martinez, 2009; Wanger et al., 2010). Furthermore, in

patients with chronic diseases like diabetes, higher negative perception of past is accompanied by higher levels of depression and anxiety (Anagnostopoulo & Griva, 2011). Health-related studies demonstrated that time perspective is effective in disease outbreak by influencing preventive behaviours. On the other hand, time perspective affects a disease's psychological consequences. Therefore, concurrent analysis of time perspective in different groups of patients and healthy individuals can reveal mutual relationship between disease and time perspective. This can clarify possible damages and prevent destructive actions under disease conditions. Diabetes and cancer as the two high prevalent diseases were selected. Of different types of diseases, type 2 diabetes and breast and digestive system cancers were evaluated in this study. The study aims to compare time perspectives between healthy individuals and diabetic and cancerous patients.

Material and methods

This was an Ex-Post Facto type study conducted on 195 patients (108 type 2 diabetes, 64 breast cancer, and 27 digestive system cancer) and 105 healthy subjects. 86% percent of the sample subjects were women and the rest were men. 79.3% of the individuals had a monthly income of less than 700 dollars and the rest had more than 700 dollars. The patients were aged 20 to 70 years, the average age was 45.4 years. The participants were selected from patients referring to the Tooba Specialized Center and Imam Hospital Center from Sari (in Iran) during September 2011 to January 2012. Samples were selected by the convenience sampling method, diseases were selected because of their outbreak age. Sample size was determined according to previous studies (Hatamloy-sadabad, Babapour-karedin, Porsharifi, 2011) and the three groups were matched in terms of age, gender, education, and monthly income. The inclusion and exclusion criteria of the study for the three groups are presented in Table 1. Data were collected through one criterion self-reporting Zimbardo Time Perspective Inventory (Zimbardo & Boyd, 1999).

Tab. 1. The inclusion and exclusion criteria of the study

Group	Inclusion	Exclusion
diabetes patients	1. at least one-year diagnosis of type 2 diabetes 2. involved in medical therapy 3. conscious inclination and consensus about participating in the research	1. suffering from other types of diabetes 2. use of insulin 3. current experience acute complications associated with diabetes 4. suffering from other chronic maladies
cancer patients	1. at least a six-month diagnosis 2. at least one session of chemotherapy 3. individual's knowledge about his/ her disease 4. conscious inclination and consensus about participating in the research	1. currently undergoing chemotherapy 2. suffering from other chronic diseases
healthy individuals	1. no chronic or acute diseases 2. written consent form	having any kind of disease results

Zimbardo Time Perspective Inventory (ZTPI)

The Zimbardo Time Perspective Inventory (Zimbardo & Boyd, 1999) is a 56-item measure consisting of five subscales, each including 9 to15 items. Participants responded to the items using a 5-point Likert-type scale (1 = very uncharacteristic; 5 = very characteristic). Its developer reported internal consistency estimates for subscale scores based on Cronbach's Alpha coefficients ranging from 0.74 to 0.82. Test–retest reliabilities (over a 4-week period) of the five subscales ranged 0.7 to 0.8.

Results

30.8% of the individuals had academic education. The three groups were matched in terms of age, gender, monthly income, and education. The demographic features of the participants are presented in Table 2. To confirm the groups matching level in age ($F(2, 288) = 2.83$, $p < 0.05$) and monthly income ($F(2, 288) = 1.47$, $p < 0.05$), Fisher's Least Significant Difference (LSD) test was performed. The homogeneity of the education ($\chi^2(10) = 5.48$, $p < 0.05$) and gender ($\chi^2(2) = 5.26$, $p < 0.05$) was evaluated with the Chi squared test.

The results indicate significant homogeneity of the three groups in age, gender, monthly income, and education features. To analyse and compare the differences of various dimensions of time perspective between the three groups, the normality of covariance matrix was first evaluated. The probability level is rejected, as per the Mauchly's test of sphericity to analyse covariance matrix equality, because the probability level of variance equality is less than 0.05 ($\chi^2(9)$, $p < 0.05$, $w = 0.68$). Therefore, time perspective was analysed with the Huynh-Feldt method.

Tab. 2. Overview of demographic characteristics of the participants

	Parameter	Number (%)
Age	20-40	79(26.33)
	41-50	110(36.66)
	51-60	65(21.66)
	>60	39(13)
	Noun character	7(2.33)
Sex	Female	257(85.66)
	Male	42(14)
Education	Illiterate	141(47)
	Junior high school	105(35)
	High school and college	49(16)
	Noun character	5(2)
Subject	Diabetes Mellitus type II	108(36)
	Breast cancer	64(21)
	Digestive system cancer	27(9)
	Healthy individual	105(35)

The results indicated that mean scores of various aspects of time perspective were significantly different so that the group and the counter effect among them is significant (Tab. 3). In other words, healthy, diabetic and cancerous groups had a different mean score in each factor as well as in general. This implies that each of the three groups ranked time perspective factors unequally. This has led to a significant group as well as a significant counter effect. Therefore, the hypothesis based on the existence of differences in groups is accepted.

Tab. 3. Analysis of differences among aspects of time orientation in three groups

	Source	Mean Square	*df*	Type III Sum of Squares	*F*	Sig.
Tests of Within-Subjects Effects	Time perspective	12.288	3.401	35. 660	134. 087	.000
	Time perspective and Group	7.622	6.802	1. 120	4. 213	.000
	Error	26.700	972.748	0. 266		
Tests of Between-Subjects Effects	Group	8.039	2	4. 020	9. 149	.000
	Error	125.654	286	0. 439		

In next step, each of the time perspective components in the three groups was compared using Fisher's least significant difference (LSD) test ($p \leq 0.05$). The results showed that in the healthy group, the time perspective dimensions were ranked as follows: a) F, b) PP, c) PN, d) PH, and e) PF. In the diabetic patient group, the order was a) F, b) PP & PN, c) PF, and d) PH. In the cancer patient group, the order was F & PP, PN, PF, and PH. The average and standard deviation of all dimensions are presented in Table 4.

Tab. 4. Comparison of the time perspective subscales using the LSD test in three groups

Fisher least significant difference (LSD) test .p-value											
Source	Healthy(H)		Diabetic(D)		Cancer(C)		Total		H vs D	D vs C	H vs C
	M	SD	M	SD	M	SD	M	SD			
Past-Negative	3.31	.57 c	3.59	.57 b	3.48	.56 b	3.46	.58 c	.001	ns	.043
Past-Positive	3.65	.63 b	3.70	.50 b	3.77	.47 a	3.70	.54 b	ns	ns	ns
Present-Hedonistic	3.05	.43 d	3.09	.46 d	3.06	.43 d	3.07	.44 e	ns	ns	ns
Present-Fatalistic	2.90	.57 e	3.33	.55 c	3.26	.64 c	3.16	.61 d	.000	ns	.000
Future	3.79	.44 a	3.83	.45 a	3.80	.43 a	3.81	.44 a	ns	ns	ns

Discussion

Data analysis revealed a significant difference in time perspective between the three groups. In all three groups, future-oriented time perspective shows the highest priority. It is the focus on future influences of present decision making by the evaluation of optimal reward probability and the real potential of obstacles and challenges (Zimbardo & Boyd, 2008). In addition, the cancerous group ranked the Past-Positive time orientation in first place followed by the forward-looking feature. The other two groups ranked the Past-Positive time orientation as the

second, indicating the existence of time equilibrium among the participants of the cancerous patients. Past-Positive experiences can increase happiness, self-esteem, and are considered a health factor in life with a negative relation with depression and anxiety (Zimbardo & Boyd, 2008; Anagnostopoulo & Griva, 2011; Osin et al., 2009). The studies on cancerous children demonstrated that forward-looking is associated with optimism (Zimbardo & Boyd, 1999). Future goals influence both approach-based and avoidance-based motivation, resulting in various performance levels (Bejornebekk & Gjesme, 2009). Furthermore, this feature influences health orientation through promoting the patient life quality (Gao, 2011). Men have the potentials to take steps by creating a symbol of positive past to have effects on optimal future (Leboric, 2010). Thorne et al. (2009) concluded that time is a symbolic and meaningful structure for patients, as well as a major factor in shaping cancer-related psychological experiences. In supporting this conclusion, it seems high scores of the positive past and future orientations in cancerous patients improve life quality, enabling them to create novel meaning in life. In the Past-Negative dimension, diabetic and cancerous patients showed a higher score compared with the healthy individuals. The diabetic group had the highest score. This finding is inconsistent with the studies indicating the association of negative perception of the past with high levels of depression and anxiety (Anagnostopoulo & Griva, 2011). It seems that ruminating over past negative memories (realistic or fancy) activates negative emotions that are related to hope in life, life style, low-spirits and despair in incurable patients (Bitsko, Stern, Dillon, Russell & Clifton, 2008; van Laarhoven, Schilderman, Verhagen, Vissers, Prins, 2011). In the Present-Fatalistic time dimension, the two patient groups showed different scores than the healthy group. The healthy individuals revealed the lowest score followed by the cancer patients and diabetics. Individuals with a fatalistic attitude believed that the future is pre-destined, thus individual measures cannot change them and they have to accept their destiny. Previous studies have indicated that Present-Fatalistic is negatively related with self-confidence, joy and attention to action consequence (Anagnostopoulo & Griva, 2011; Zimbardo & Boyd, 1999). This orientation negatively correlated with social acceptance and social participation (Zambianchi & Bitti, 2008). Diabetes has no definite treatment and the affected patients have to apply some control over their lifestyle (diet, medication etc.). Therefore, these patients probably adopt fatalistic temporal orientation. As chronic diseases have their own special physiological features, there are common conditions among these patients like pain, exhaustion, as well as behavioural responses, such as depression, anxiety, fear, and decreased attention (Hatamloy-sadabad, Babapour-karedin, Porsharifi, 2011). Therefore, tolerating everlasting pain and suffering has probably led to this orientation. Paying attention to repairing time orientation in these patients is of significant importance.

This study was conducted on type 2 diabetes and breast and digestive system cancers. Generalizing the results to the other diseases should be done carefully. The samples were selected from individuals referred to public centers; research on individuals referred to private centers seems necessary. It is proposed that future

studies focus on the interaction between temporal orientation, disease acceptance and health-oriented behaviours.

Conclusions

Our findings revealed that patients have a different time perspective compared with healthy people. Therefore, it can be concluded that disease can influence the adopting of different time orientations. Furthermore, the difference observed between the two patient groups implies the importance of the disease type on modulating time perspective. In conclusion, health and treatment programs can reduce individual vulnerability in tough conditions by concentrating on how time perspective is shaped in various groups of the society.

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