Control Strategy as Predictor of Quality of Life of Patients with Diabetes Mellitus

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ABSTRACT: Diabetes mellitus is a chronic disease that requires long-term treatment which may affect the quality of life of patients. They need control strategy to deal with the disease. This study examined the influence of control strategies on quality of life of patients with diabetes mellitus. Participants in this study were recruited from outpatients with type II diabetes mellitus from district hospital. There were 104 participants completed three scales: primary, secondary control strategy and quality of life. There were 42 men (40.4%) and 62 women (59.6%). The mean age of participants was 56 years (SD=8.6). Participant's mean time since diagnosis was 12.28 years (SD=8.44). For the highest level education attainment, 13% had completed elementary school, 31% had completed junior school, 38% had completed senior high school and 22% had completed university studies. We tested a model in which primary and secondary control strategy were hypothesised to be predictors of quality of life using regression analysis. In the first analysis, the model was significant (F=3.214, p<0.05), which means that control strategy (primary and secondary control strategies) as predictor of the quality of life. A further regression analysis was undertaken to ensure that any effect found for diet of diabetes mellitus and negative emotions. Primary and secondary control strategies as predictors of the effort on a diet diabetes mellitus (F = 3.555, p<0.05). Secondary control strategies can reduce the perceived negative emotions (t = -2169, p<0:05).

Keywords: control strategy, quality of life, diabetes mellitus

Introduction

Diabetes mellitus is one of the chronic illnesses often strikes in middle and older age groups and most people diagnosed with a chronic illness will live for many years with their condition. There are number of previous researches on quality of life of patients with diabetes, whether related to demographic (Javanbakht *et al*.,2012), and also the costs that must be paid for treatment (Coffey, *et al*., 2002), coping style (Coelho and Prata, 2003), influence caregiver's support to control diabetes mellitus (Obesity, Fitness & Wellness Week, 2006). Previous researches showed that the quality of life of patients with diabetes is important because this disease can affect the whole life of the patient, physically, psychologically, socially and spiritually. Adjustment to diet, physical activity limitations and visit doctor were associated with negative emotion (Wrosch *et al*., 2002; Widyarini, 2012). Regarding to family and peers, social support was important variable that can improve health conditions of the patient (Simoni *et al*., 2006). Quality of life can be defined as the degree of person can enjoy the possibilities that are important in life and can be evaluated subjectively and objectively. An objective evaluation is the description of health, income, housing, friendship networks, activities, social roles and so on, while subjective evaluation includes satisfaction with living conditions (Murali *et al*., 2006). This research is focused on satisfactions of healthy behavior, diet and also the degree of negative emotion.

Patients need to make adjustment to achieve good quality of life. According to control theory, individuals are basically active regulate their life. This effort is called the active control strategy Primary control striving refers to individual's attempt to change the external world so that it fits with their personal needs and desires. Typical examples of primary control striving are persistence in goal striving or investment of time and effort if obstacles emerge. Secondary control striving by contrast is targeted at the inner world and involves individual's efforts to influence their own motivation, emotion and mental representation (Rothbaum, *et al.*, 1982; Heckhausen, 1997). Researches showed that patients tend to use secondary control strategy to cope with health problem as the patients with diabetes mellitus are in older age with limitation in physical resources (Widyarini, 2009; Widyarini, 2012). However, it has not been widely discussed, whether the control strategy is a good predictor in determining the quality of life of patients with diabetes mellitus. Therefore, this study aims to determine the influence of control strategies on quality of life of patients with diabetes mellitus. Considerations from our review of the above literature, this research tested the following

hypothesis. First, strategy control influences quality of life. Second, control strategy can reduce negative emotion.

Method

Sampling and Recruitment

Participant were 104 outpatients from Dr. Soebandi Hospital at Jember, East Java, Indonesia who were diagnosed with type 2 diabetes. Participants completed four scales, *i.e.* primary, secondary control strategy, quality of life and negative emotion. There were 42 men (40.4%) and 62 women (59.6%). The mean age of participants was 56 years (*SD*=8.6). Participant's mean time since diagnosis was 12.28 years (*SD*=8.44). For the highest level education attainment, 13% had completed elementary school, 31% had completed junior school, 38% had completed senior high school and 22% had completed university studies.

Measures

Participants were asked to indicate how true each statement was for them on a 5-point scale, ranging from 1 (almost never true) to 5 (almost always true).

Primary Control Strategy Scale: This 30 items scale measures primary control strategy (Heckhausen, 1997), aimed at attaining health goals:selective primary control strategy (15 items) and compensatory primary control strategy (15 items). Cronbach alpha were 0.8779.

Secondary Control Strategy Scale: This 26 items scale measures secondary control strategy (Heckhausen, 1997), aimed at the inner world and involves individual's effort to their own motivation, emotion and mental representaion: selective secondary control strategy (13 items) and compensatory secondary control strategy (13 items). Cronbach alpha were 0.8907.

Quality of Life Scale: This 27 items scale measures health behaviors undertaken by people to enhance or maintain their health (Tjokroprawiro, 1993; Taylor, 1995; Safarino, 1992). Cronbach alpha were 0.9348.

Negative Emotion Scale: This 40 items scale measure negative emotion in patients with diabetes mellitus: Anger, Fright/anxiety, Guilt/shame, sadness, envy/jealously (Lazarus (1991). Cronbach alpha were 0.9266.

Results And Discussion

Descriptive Statistics

Based on education level, age and gender of participants, there were 104 outpatients from Dr. Soebandi Hospital at Jember, (62 woman, 42 men, mean age = 56,08 years), mostlyhave high school education background and were diagnosed with type 2 diabetes (mean times since diagnosis = 12,3 years).

Regression Analysis

Predicting quality of life from control strategy

Regressions were conducted which the predictors were control strategy (primary and secondary control strategy). In Table 1, control strategy was significant predictor of quality of life. In this model, primary and secondary as one construct of control strategy has a critical role as predictor of quality of life. If primary and secondary control strategy were separated in this analysis, primary (β =.228, t=1.771) and secondary control strategy (β =.177, t=1.254) were not associate with quality of life.

Predicting exercise, diet, visiting doctor, weight control and negative emotion from control strategy

Further regressions were conducted to explore the model. Control strategy as a good predictor for diet (F=3.555, p<.05), in which primary control strategy (β =.139, t=1.998) were associated with diet and secondary control strategy (β =.088, t=1.142) were not associated with diet. Secondary control strategy ((β =-.149, t=-2.019) were associated with negative emotion but not associated with primary control strategy (β =.037, t=.554). Finally, control strategy were not a good predictor for exercise (F=1.692, p>.05), visiting doctor (F=4.25, p>.05), and weight control (F=2.731, p>.05).

The current research examined the influence of control strategy on quality of life of patient with diabetes mellitus. We predicted that control strategy would be a good predictor for quality of life. Starting with direct effects of control strategy on quality of life, we obtained result that consistent with our prediction. In terms of primary and secondary control strategy, both acts together as predictor of quality of life. It means that higher control strategy can improve quality of life patients in term of satisfaction for adjustment to their diet, exercise, weight control and visiting doctor.

Table 1: Regression Analysis

Predictors	*R*	Adj *R* Square	*F*	*β*	*t*
Quality of Life	0.245	0.060	3.214*		
Primary Control Strategy				0.228	1.771
Secondary Control Strategy				0.177	1.254
Exercise	0.180	0.013	1.692		
Primary Control Strategy				0.039	1.042
Secondary Control Strategy				0.048	1.67
Diet	0.256	0.047	3.555*		
Primary Control Strategy				0.139	1.998*
Secondary Control Strategy				0.088	1.142
Visiting Doctor	0.091	-0.011	4.25		
Primary Control Strategy				0.021	0.921
Secondary Control Strategy				-0.008	-0.292
Weight Control	0.266	0.033	2.731		
Primary Control Strategy				0.028	1.077
Secondary Control Strategy				0.049	1.694
Negative Emotion	0.197	0.020	2.038		
Primary Control Strategy				0.037	0.554
Secondary Control Strategy				-0.149	-2.019*

Note : Adj R square = Adjusted R square

**p<.05. **p<.01. ***p<.001.*

Second hypothesis control strategy can reduce negative emotion of patients

Negative emotion is a common problem with patients due to strict regiments of treatments. The results showed that control strategy were not good predictor for negative emotions. Given that, secondary control strategy was associated with negative emotions. It means that higher secondary control strategy lower negative emotions of patients.

The current results also confirm the importance of control strategy in influencing quality of life of patients. Primary control strategy plays a key role in improving the functional health behavior as a primary goal, whereas secondary control strategy serves as a source of motivation for primary control and can decrease the negative emotions felt by the patient. Primary and secondary control strategies play a role in two aspects, which makes selection of a behavior and keep motivations when they cannot achieve the goals or referred to compensation. Patients will select various options to improve health conditions. One alternative to improve the health condition is to perform healthy behaviors. In the process of carrying out these healthy behaviors, patients require secondary control strategies to maintain motivation.

As mentioned by Schulz and Heckhausen (1996) and Glasgow *et al*., (2006), the motivation to perform the primary control is central in achieving the objectives, but not the focus of attention in this approach. In this case, the primary controls provide guidance through the selection process. The selection process is controlled or regulated by a source of motivation and abilities (competencies) that are owned by individuals. The interaction will give a positive (*i.e.* achievement of goals) or negative (*e.g.* failure) results. Success in achieving the goals will have an impact on efforts to maintain or improve skills and motivation. Experience of failure occurs when individual is not successful in increasing its capabilities, and could occur when failures due to a decreased ability with age and failure due to something unexpected happens in humans. Unpleasant experience will reduce the ability and motivation of individuals, therefore compensatory mechanisms are necessary to maintain and improve motivation. Important process is the selection mechanisms that determine the choice of goals to be achieved.

Several limitations of this study should be considered. First, this study did not involve physical measurements, such as the level of blood sugar and body weight measurements of patients. It is important to explore how control strategies influence better health conditions

(Jack *et al*., 2004; Wrosch *et al*., 2002). Second, primary and secondary control strategies involve the role of caregivers to help patients cope with illness. In this case, further study is needed to analyse social support from caregiver that will affect the quality of life. Research conducted by Lewis and Rook (1999) showed that social control can explain how personal relationships can affect health. Social control, whether from family or friends can reduce behaviors that compromise the health (health compromising behavior) or enhance behaviours that promote health.

Conclusion

Our findings showed that control strategy influences the quality of life. It means that higher control strategy can improve quality of life patients in term of satisfaction for adjustment to their diet, exercise, weight control and visiting doctor. In addition, secondary control strategy was associated with negative emotions, indicating higher secondary control strategy lower negative emotions of patients.

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